



Enrolment patterns in Nordic Higher Education, ca. 1945-2010. Institutions, Types of Education and Fields of Study

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Mikael Börjesson, Sakari Ahola, Håvard Helland &
Jens-Peter Thomsen (eds.)

Working Paper 15/2014

NIFU

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Preface

In 2011, the research network Nordic Fields of Higher Education was established with financial support from NordForsk. The network is headed by Professor Mikael Börjesson, Sociology of Education, Uppsala University, and consists of research groups from various higher education institutions and research institutes in Denmark, Finland, Norway and Sweden. In 2012, some members of the network, representing Uppsala University, the University of Copenhagen, the University of Turku, the Centre for the Study of Professions at Oslo & Akershus University College and the Nordic Institute for Studies in Education, Research and Innovation, were successful in a grant application to the NordForsk research programme Education for Tomorrow to conduct a research project on the topic of network. We are taking the opportunity to disseminate some preliminary results of this research project in a working paper distributed in connection with the closing conference of the network in Oslo, October 8-9, 2014.

This working paper on the patterns of expansion of higher education in the Nordic countries from 1970 to 2010, is part of a more comprehensive study of recruitment patterns that will be completed next year.

We wish to thank Chris Allinson (Brighton) for copy-editing this paper and Tove Hansen (NIFU) for technical assistance.

Oslo, October 2014

Sveinung Skule
Director

Nicoline Frølich
Head of Research

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Summary

The aim of this report is to give an overall account of the patterns of enrolment to higher education in the four Nordic countries Denmark, Finland, Norway and Sweden. Enrolment is analysed from a range of different angles.

First, we study the overall numbers of students over the last half century. Roughly, the systems have expanded more than tenfold in a period of a little more than half a century, and we have seen a transition from systems of elite education to mass education, to now having reached a stage of universal access. Higher education in 2014 simply means something very different from what it meant in 1954. There are a number of explanations for the overall expansion. At a very general level, the economic transition from a society largely based on agricultural production to an industrial society, and to today's post-industrial service-based economy is closely related to the expansion of the educational system in general, and the higher education system in particular. This is conditioned by a political will to expand the system and increase the funding in order to do so. Such an ambition has been apparent in all studied countries. This ambition has been paired with an increasing demand for higher education, clearly expressed by the increased participation of women in higher education. Another factor is that the educational offer has been widened due to, among other things, upgraded credential requirements for many semi-professions. In addition, many educational programmes have been extended, increasing the time individuals spend in higher education, which affects the overall volume of the system. In later years, the intensified internationalisation of higher education has meant increasing numbers of incoming students, forming a substantial part of the student population.

We also highlight that the expansion has not been continuous, but rather occurred in two large waves, in the 1960s and in the 1990s. Very different conditions were at hand for each of the two phases. The first expansion of the 1960s was implemented at a time of long and stable economic growth and an increasing demand for a more skilled labour force. This was also driven by a demographic growth, especially when the baby-boomers of the 1940s reached the age of university entrance in the 1960s. This stands in sharp contrast to the expansion of the 1990s, which occurred in a time of economic stagnation and crisis, and with a declining youth population.

Second, we analyse the enrolment for the last three decades with regard to different types of education, such as divisions between courses and programmes, types of programme and the length and the level of educational programmes. Today, all the Nordic countries have implemented the three-cycle structure of the Bologna process, where the overlaying cycles require exams from the underlying cycles. For our four countries it is noteworthy that the time frame has differed. Denmark had already in 1993 introduced a 3+2+3 system, which was thus in line with the Bologna model. For the others it ranged from the implementation in Norway in 2003, to Finland in 2005, and then Sweden in 2007. Even more important, the Bologna system was varied in line with the existing national systems. In

Norway, higher education studies had traditionally led to two types of degree, bachelor's and master's, but these were normally longer programmes, leading to up to 6 years. In Finland, the master's degree dominated at the universities and the bachelor's degree was less important. Sweden had probably the most complex system, with a large variety of programme length, which had to be squeezed into the two main types of degrees. The conclusion here is that the homogenisation imposed by the Bologna process on the four studied countries has meant very different things for each of them: a less complex system in Sweden, shorter programmes in Norway, a strengthening of the bachelor's programme in Finland, while Denmark has been rather unaffected since it had already introduced the Bologna structure in 1993.

Third, we analyse the dispersion of the students over the fields of study on different levels of aggregate. We have seen a developmental trait that the Nordic countries have in common: there has been an enormous growth in Social science, business and law, and this field is the largest in terms of student numbers at the end of the observation period (around 2010). This growth seems mainly to be driven by a rapid expansion of Business administration. This development may be understood in terms of three kinds of explanation. There has been an educational inflation, which has led to exceeding educational requirements for the same kind of work. Certain jobs for which completed upper secondary education would suffice in the past, may now require an MBA degree. The development may also be seen as a reflection of changes in the economy. The industry of business services, for example, has grown tremendously and its share of the total labour force has increased in all four countries. Another big and growing field in all the Nordic countries is Health and welfare. This development may also be viewed as a reflection of increasing demand. The industry of Health and social services has grown enormously. The field of Education has increased numerically and decreased relative to other fields in all four Nordic countries. The development in Humanities and arts has been similar to that of Education in Denmark and Norway. The field of Science, mathematics and computing has developed unevenly, with a substantial increase in the subfield of Computing up until the burst of the dotcom bubble in the early 2000s, followed by an initial decrease and then a small increase in the last couple of years. In Engineering, manufacturing and construction we have seen a downward trend relative to other fields. One dimension of this development may be the abovementioned reduction of the manufacturing industries in the Nordic countries. One can also notice a difference between fields most closely related to the private industrial sector and fields oriented towards public sector such as Health and Education, where the conjunctures for the former, especially Technology and Science, varies more than for the latter.

Fourth and finally, we analyse enrolment in relation to the landscape of higher education institutions, depicted by types of institution as well as specific institutions. In the Nordic countries the institutional structures of higher education have changed considerably during the years of expansion and massification. In addition to the growth in numbers and size of institutions, the general trend has been one of overall diversification. This stands in contrast to the situation before the "education explosion" after the Second World War, when the basic structures of the university systems were quite similar, with larger universities accompanied by specialised institutions of engineering and business, as well as small institutions of fine and industrial arts. During the post-war expansion new universities and university colleges were established. They usually had a strong regional mission and character. Some of these types of institution have later expanded and gained university status.

Despite the differences of the national systems we see possibilities for a common classification including three basic types of institution: universities, university colleges, and specialised institutions. Some specialised institutions have had university status in the national system from early on, and they could be also called mono-faculty universities, as in the Danish case. The specialised institutions include three main types: technical institutions, business schools and art academies.

Regarding system expansion, relatively similar overall trends emerge. After the long years of growth in the number and size of higher education institutions, expansion has slowed down or levelled out, and there has been a move towards structural rationalisation and mergers. Examples of relatively

aggressive merger policies can be found, for instance, in Denmark and Finland. On the other hand, expansion has been maintained by upgrading new sectors, formerly not part of higher education, to the higher education system. The founding of the AMKs in Finland serves as an example of a reform which more than doubled the number of higher education institutions overnight. If we look at the expansion in relative terms, it is evident that growth has been directed especially to the specialised institutions and the university colleges. This is very clear in the case of Finland, where the new type of institutions, the AMKs, introduced in the 1990s, saw their number of students increase steeply at the same time as the enrolment to the universities was staggering. In Sweden, the university colleges tripled their numbers while the universities increased by no more than 50 per cent. For the latter half of the 1990s, when there are relevant data in Norway, the university colleges grew continuously, while the universities had stable numbers. The exception here is Denmark, where the university sector has had the most prolific development and a steady increase in absolute and relative numbers.

One conclusion from the institutional development is that much evidence suggests that the university sector has become much more exclusive in relative terms over time. While, on the one hand, the whole system of higher education has expanded rapidly in our four countries, and increasing shares of an age cohort have entered higher education, studies at traditional universities and specialised institutions, have on the other hand become more exclusive among higher education students. Whether this also translates into a more socially and meritocratic exclusive recruitment to these institutions will be a central question in future publications from the project.

1 Introduction

Mikael Börjesson

It is often said that there exists a specific “Nordic model of higher education”. This model is characterised by largely publicly-owned systems, which are relatively closely regulated by the state, include high levels of public funding and no or low student fees, with strong influences from egalitarian traditions. In such a model, higher education has also been seen as an important pillar in the welfare system, not only through the emphasis on broad and equal access, but also by educating the professionals needed for the development of the welfare state (Välimaa 2005; Vabø and Aamodt 2008; Gornitzka and Maassen 2012).

However, today there is increasing evidence that the Nordic systems of higher education have moved in new directions and it is now an open question if a unified model still exists. Among the most important transformations we can mention the following. The number of students has increased dramatically and this has also involved the establishment of new institutions. Internationalisation has become a more integrated part of the national systems, and an increased emphasis on efficiency, competition and market orientation has become apparent. The Bologna process has been implemented – in itself an indication of the increased importance of the international level – although timetables and the degrees of adjustments have varied (Kim 2002, Tomusk 2006, Kehm, et al. 2010). In short, the systems appear to have been transformed from cohesive and standardised entities, administered largely within the nation state, into more diverse and complex national and international higher education landscapes.

There is today a large body of literature on these different processes of transformation for individual countries as well as for such larger regions as the EU. Most of this literature focuses on the organisation of higher education, including different aspects of policy change and implementation of reforms.¹ There is also a substantial literature on recruitment to higher education in terms of educational attainment and social mobility (Breen & Jonsson 2005). A central tradition is focusing on inequality of access as regards class, gender and ethnicity, which comprises both studies of individual countries (e.g. Hansen 1999; Mare 1979; Gambetta 1987; Mastekaasa 2005; Helland 2013; Modood 2004) and comparative approaches (e.g. Shavit & Blossfeld 1993; Erikson & Jonsson 1996; Heath, Rethon & Kilpi 2008). Yet another area of research relates to the expansion of higher education. The work of Martin Trow in the early 1970s, on the transition of higher education from an elite system to a mass and consequently a universal system (1972), is canonical.

¹ For references, see the complementary project report on the organisation of higher education in Denmark, Finland, Norway and Sweden, NIFU report 34 (2014).

These three mentioned streams of research are related to each other. The sheer size of the higher education system largely determines organisational aspects as well as recruitment patterns. A larger system demands more administrative resources and tends to be more complex. This also implies more diversified recruitment patterns. The expansion of a system often produces new social divisions, where higher education in itself becomes less distinguishing and the seat of learning and the fields of study more important. In our project, Nordic Fields of Higher Education, our ambition is to combine studies of the organisation of higher education with studies of the recruitment patterns.

The aim of this report is to give an overall account of the enrolment patterns in the four Nordic countries Denmark, Finland, Norway and Sweden. Each country is devoted a separate chapter. Enrolment is analysed from a range of different angles. First, we study the overall numbers of students over the last half century. This implies that we capture the two largest waves of expansion of higher education in modern history, that is, those in the 1960s and 1990s. In addition to the total number of students enrolled, the number of entrants and degrees taken is considered, and all is set against the demographic development. For these general analyses of the expansion, we also take into account differences between men and women. Second, the enrolment is analysed with regard to different types of education, such as divisions between courses and programmes, types of programme and the length and the level of the educational programmes. Third, the dispersion of the students over the fields of study is analysed on different levels of aggregate. Fourth and finally, enrolment is analysed in relation to the landscape of higher education institutions, depicted by types of institutions as well as specific institutions. The report contains a conclusion, drawing upon the themes analysed for each country and comparing the results cross-nationally.

The data and analyses presented in this report are filling an apparent lacuna in the literature on higher education. Studies of enrolment tend to focus on shorter time-spans, often is the last 10 years covered in statistical products from national statistical organisations and national agencies of higher education. If longer periods are covered, the data referred predominantly cover only certain aspects of the enrolment, such as the total enrolment or the share of a cohort that enters higher education, but more seldom more exhaustive analyses. As stated above, most publications refer to individual countries, and comparisons are rare. One exception is of course the OECD reports, especially the annually published Education at a glance (OECD 2014), but the data presented on participation in higher education almost exclusively focus on the last available year with data. The level of aggregation is very high. Data on fields of study are only presented on the most aggregated level, the 1 digit level, and no analysis of types of institutions is provided, only a separation of tertiary programmes of type A (ISCED 5A, more theoretical oriented programmes) and type B (ISCED 5B, more vocational oriented programmes) is used.

For the Nordic countries, some elementary data are found in the report Nordic Education – Key Data 2012 (Nordic Council of Ministers 2012). The Nordic Council plans to produce a Nordic Education at a Glance and the first steps towards this have been taken. In the report Højere uddannelse i Norden. Kortlægning af eksisterende data og informationer om højere uddannelse i Norden [Higher Education in the Nordic Countries. A Mapping of Existing Data and Information on Higher Education in the Nordic Countries] (2013), Johannessen uses existing data and compiles them in a comparison of the educational key figures of the Nordic countries. In both these cases, the data used are aggregated (field of study are aggregates of the 1-digit level), often not longitudinal and not exhaustive (there is no information on type of studies or type of institutions). Our ambition here is to complement these existing comparisons with a more substantial account with regard to timespan, depth, and exhaustiveness. At the same time we need to acknowledge that the richness in the details also comes with a price, a less direct comparability between countries since we have prioritised as complete a picture as possible for each country. The comparisons between countries, in our case, Denmark, Finland, Norway, and Sweden, is primarily done on a more aggregated level, not by comparing individual numbers and share, but by comparing patterns and trends.

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2 Denmark

Jens Peter Thomsen

2.1 Introduction

The following chapter will outline general trends in recruitment to higher education in Denmark since the Second World War, in particular dealing with the period from 1980 onwards. The chapter will begin with a brief historic overview of the changing higher education policies in Denmark. The following section will give a general description of the different types of institutions in Denmark. After this, the chapter deals with the expansion of higher education depicted through various figures. The differences in numbers of enrolled students in the different types and levels of higher education will be considered, and the chapter will finish with descriptions of changes in choices of field of study.

2.2 The policy context

Since the Second World War, Danish higher education system policies have been characterised by a focus on educational expansion and massification, of policies aimed towards equality of opportunity on the one side and towards efficiency and qualifications on the other (followed by increasing external influence, governmental steering and regulation).

The massive economic growth in the 1960s gave way to a vast increase in higher education enrolees, and in this period many first-generation students gained access to higher education. The service sector grew rapidly leading to a shortage of highly qualified labour, and higher education concomitantly moved into the centre of educational policy in the 1960s. Free access to higher education further enabled the massive rise in number of students in the 1960s. Taken together, the economic growth allowed for the conjunction of the two dominant educational policy goals in the 1960s: qualification of the work force and equality of opportunity.

With the economic recession in the 1970s, general *numerus clausus* policies were introduced trying to regulate the intake according to the needs of the labour market. The 1970s marks the beginning of increasing government steering and policy interventions, later coming in the shape of New Public Management (from the 1980s onwards). All through the 1990s the higher education institutions continued to expand and institutions have accepted more and more students. This development seems to continue, as the Ministry of Education expects that no less than 62 per cent of all 15 year olds in 2012 will eventually complete a higher education degree programme. In Denmark, higher education remains free of any tuition fees and Denmark has, even compared to the other Nordic countries, a relatively generous universal government grants system.

2.3 Danish higher education institutions – a typology

The oldest university institutions in Denmark, the two universities of Copenhagen and Aarhus, along with the Danish Technical University and the art institutions of the Royal Danish Academy of Fine Arts and the Royal Danish Academy of Music, are also the ones where competition for study places is often most intense. The 20th century up until the Second World War saw the establishment of the multi-faculty university of Aarhus (1928), Copenhagen Business School (1917) and Aarhus School of Business (1939), and the economic boom of the 1960s was followed by the establishment of three new multi-faculty institutions. The university colleges originate from an old tradition of seminaries (the oldest dating back to 1760s), detached from the other higher education institutions. These seminaries have traditionally educated welfare professionals (teachers and later on nurses, child care and social care workers). In 2007, a law was passed merging a number of smaller seminaries and similar institutions into eight university colleges. Finally, at the level of short cycle higher education, nine business colleges were formally established in 2009, hosting a range of programmes formerly taken at a number of smaller trade, technical and agricultural schools. The last couple of years have seen moves towards centralisation of higher education institutions – mergers have taken place at all levels, and the higher education institutions have all been placed formally under the jurisdiction of the Ministry of education and research.

In Denmark, higher education institutions today consist of a number of different types:

- Multi-faculty universities. These are the research-intensive higher education institutions, and are often the large institutions with the highest number of employees and students in the field of higher education. These can be divided into older and newer institutions. The older institutions are often the largest and the most prestigious (Aarhus and Copenhagen), while the newer (University of Southern Denmark, Roskilde University, and Aalborg University), founded in the 1960s and onwards, are smaller and situated further from the major cities in Denmark. These institutions all educate graduates towards a wide range of occupations.
- The Mono-faculty universities can also be divided into older and newer institutions. The old institutions are the Danish Technical University, The Royal Veterinarian and Agricultural School and the Pharmaceutical School (the latter two were merged into the University of Copenhagen in 2007). The newer institutions include the two business schools in Denmark and the IT-university. The graduates from these institutions will often be more specialised and often be more oriented towards the private job sector.
- Art institutions, as opposed to the other higher education institutions, have until recently been under the domain of the ministry of culture. These institutions include the two Schools of Architecture, the music conservatories and the School of Fine Arts. Graduates are trained in specific professions, such as an architect, or musician.

These first three kinds of institutions are all university institutions, which means that they are formally governed by the same university act, and that they all have extensive research activities and have master's and PhD programmes.

- University colleges: These are not university institutions and they only have a fraction of the research activities of the universities. University colleges educate professional bachelors, often over 3-4 years, in large welfare professional programmes for teaching, nursing, and social work and pedagogy (pre-school teacher, special needs teacher). The 10 university colleges in Denmark are a result of a series of mergers, where a number of older seminaries were merged into larger university college institutions, giving graduates the right to call themselves professional bachelors.
- Business colleges. There are eight business colleges in DK, training students in private sector oriented programmes of shorter duration (2-3 years).

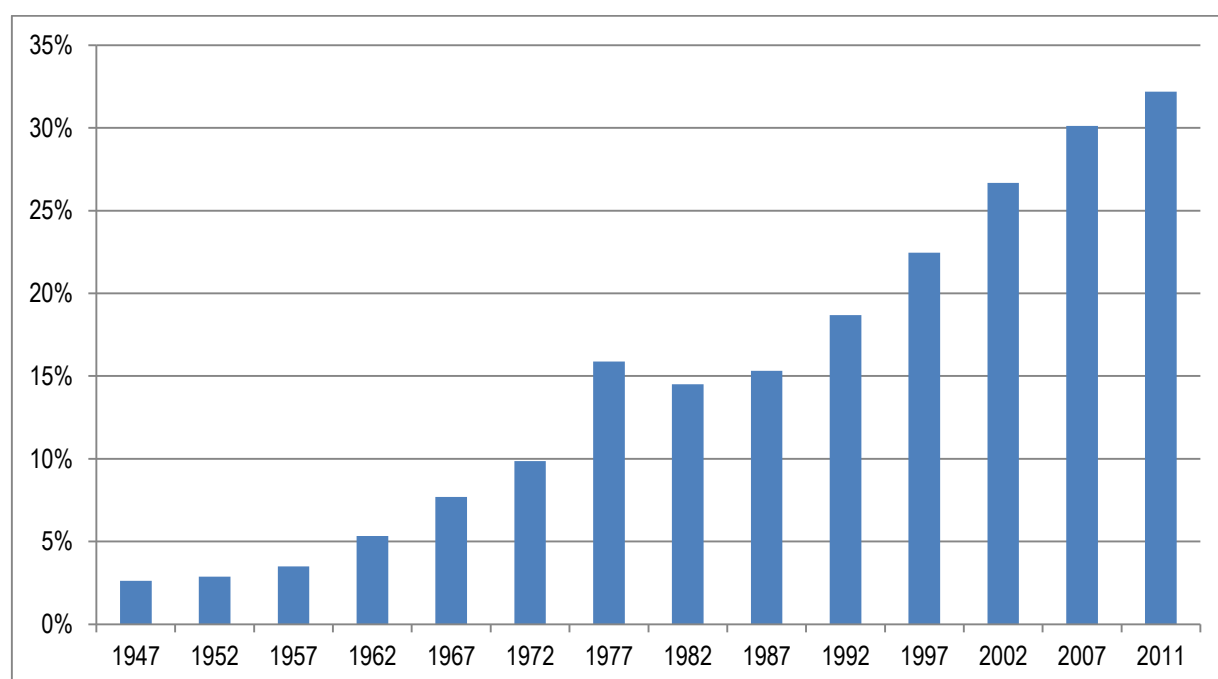
2.4 Expansion of the system and rising educational levels

2.4.1 General enrolment and admission rates

As is the case in the other Nordic countries, Denmark has witnessed a massive increase in the number of students enrolled in higher education since the Second World War. A greater and greater share of a youth cohort attends a higher education programme today than was the case 60 years ago. Figure 2.1 shows how many students that are enrolled at universities and university colleges as a percentage of 20-29 year-olds in each year 1945-2011. The massive rise in students enrolled is striking, more than a tenfold increase since the Second World War. This increase is especially noticeable at the university level, as figure 2.2 shows.

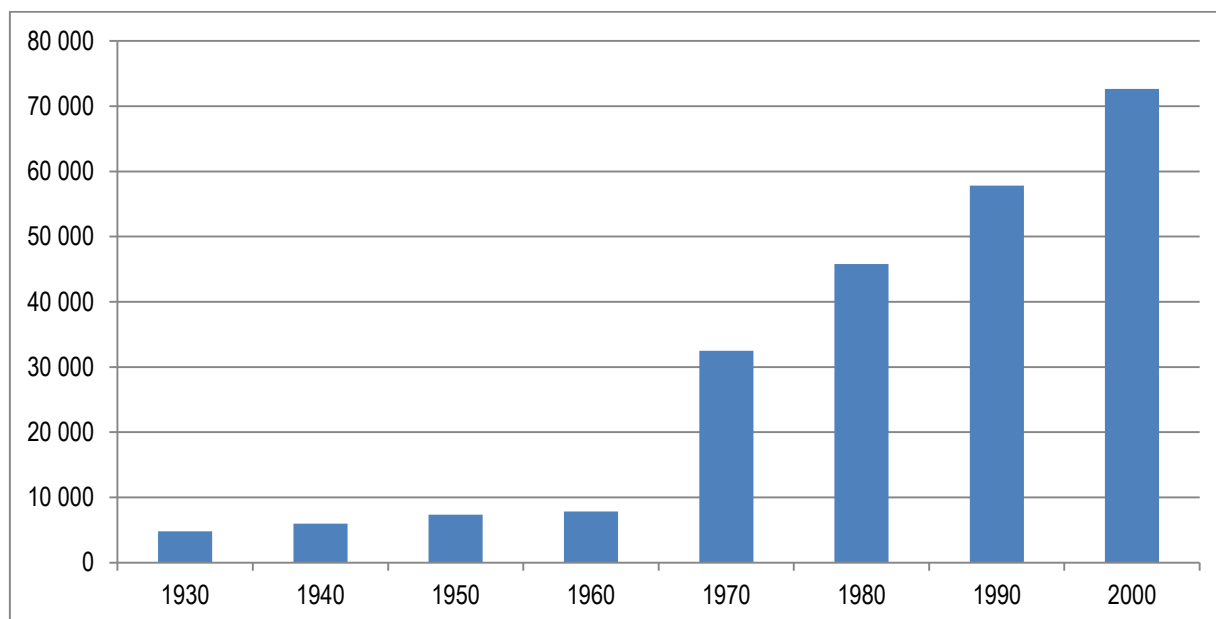
Figures 2.1 and 2.2 reflect changing policies aimed toward the expansion of the higher education system. During the post war period, with massive economic growth from the end of the 1950s to the start of the 1970s, there was a vast increase in intake to higher education, and in this period many first-generation students gained access to higher education. As written earlier, with the economic recession in the 1970s, general *numerus clausus* policies were introduced; a limit on the higher education intake was introduced, leading to much slower growth or even a fall in the number of student enrolment when seen in relation to a youth cohort.

Figure 2.1: Share of 20-29-year olds enrolled at universities and university colleges, 1947–2011.



Source: Statistical yearbooks, Statistics Denmark.

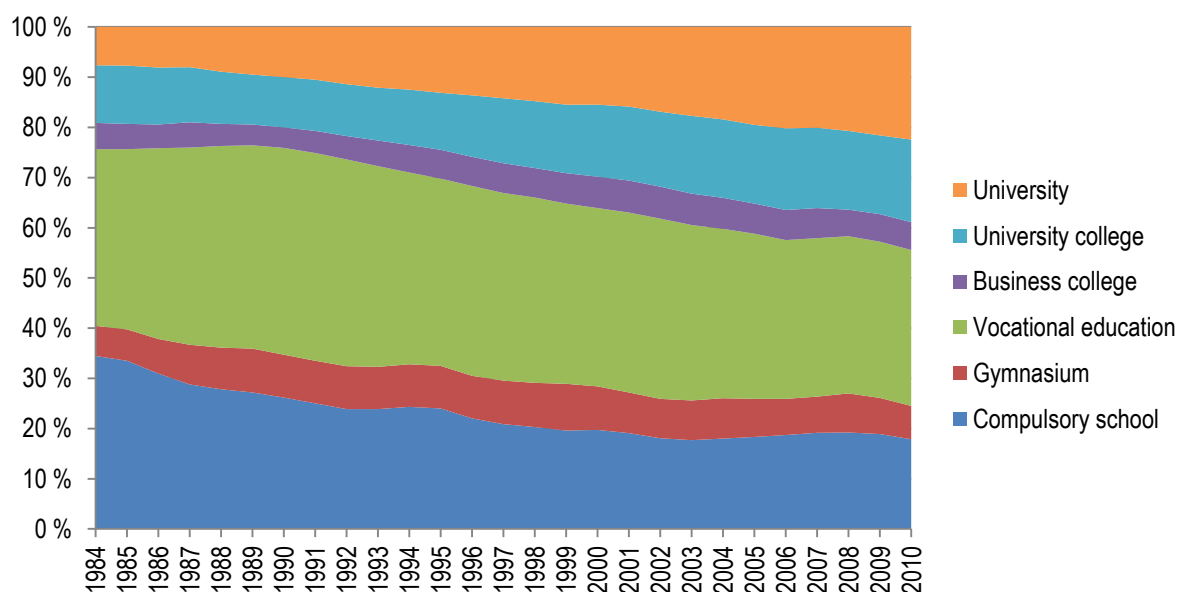
Figure 2.2: Number of enrolled university students, 1930–2000.



Source: www.statistikbanken.dk, and "50-års oversigten", Statistics Denmark (2001).

Figures 2.3 and 2.4 detail the development from the 1980s onwards. Figure 2.3 clearly shows the rising level of education in the population (here shown as the educational status of 25 year olds; whether they are enrolled in higher education or have completed a higher education degree). Whereas only about 25 per cent of all 25 year olds had embarked on a higher education programme in 1984, 25 years later over 40 per cent had done so.

Figure 2.3: Educational level for 25-year-olds 1984-2010 (completed or enrolled)

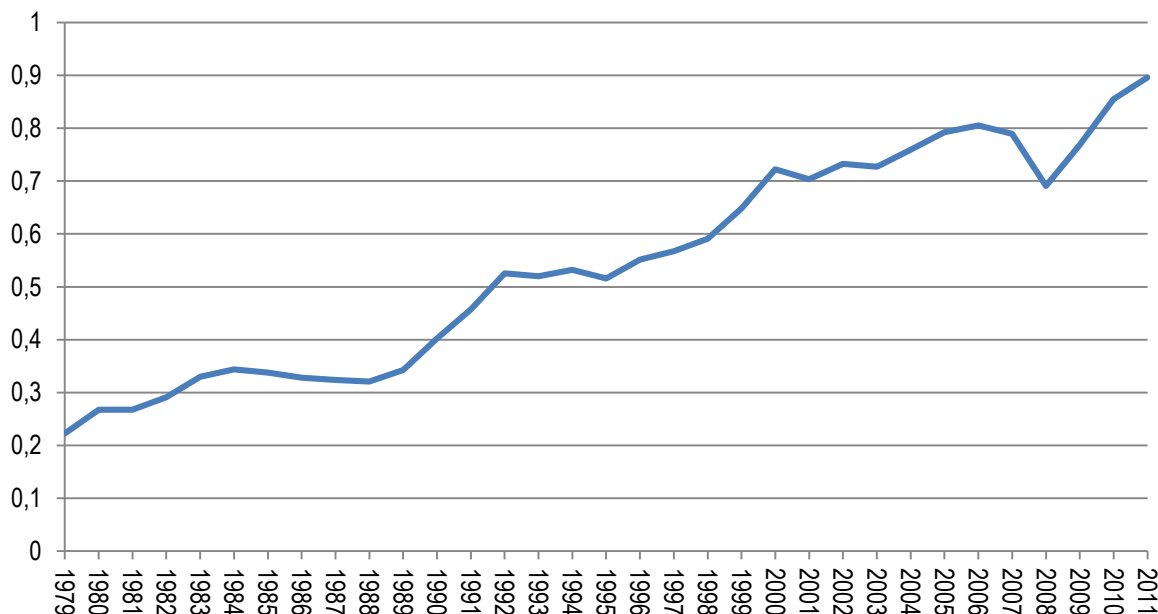


Source: Calculations based on register data from Statistics Denmark.

Whereas the first big wave of student increase took place in the 1960s, the next big wave of increased higher education intake was from the period from 1989 onwards. In 1989, student grants were also raised significantly, and a financing system was introduced paying higher education institutions per student admitted. Figure 2.4 shows the increase in the number of entrants to universities and university colleges taking into account the fluctuations in the youth cohort sizes. Several things are

worth noting in figure 2.4. Cohort-adjusted enrolment stagnated between 1984 and 1988, whereupon enrolment rose in the period up to 2006, fell again up to 2008, and has been on the rise again over the last couple of years.

Figure 2.4: Admission rates for an average cohort of 20-25 year olds, university colleges and universities.



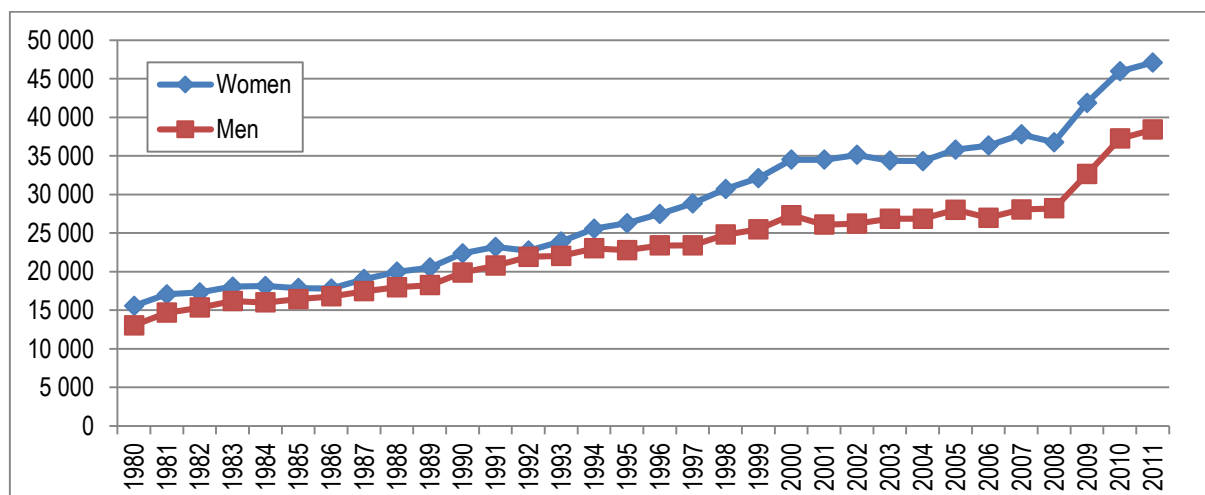
Note: The figure depicts changes in access for students of all ages relative to a youth cohort of 20-25 year-olds. It provides us with a measure of how many study places that are available each year relative to a given youth cohort, and should not be interpreted as the share of an actual cohort that enrolls each year (for instance, in 2011, 60,500 students were enrolled and the average number of all 20-25 year-olds was 69,000, equalling 0.9). The figure reflects the fact that 1989-2006 witnessed both a rise in students enrolled but also a drop in youth cohort size.

The last many years, institutions have admitted more and more students. Today, the Ministry of Education expects that 62 per cent of all 15 year-olds in 2012 will eventually complete a higher education degree programme. This development has recently led the minister of education to question the need for an increasingly higher educated work force in the future (Politiken, March 20th, 2014).

2.4.2 Gender

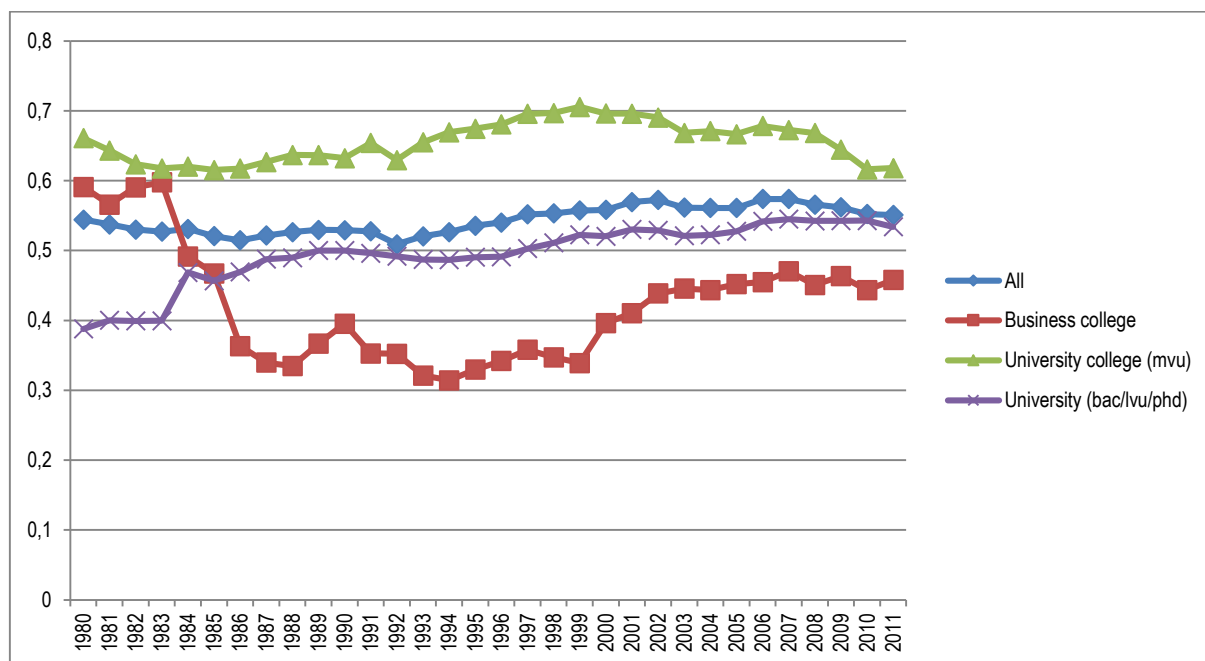
The history of higher education expansion is also the history of the rise of women in higher education. Today, women make up the majority of university and university college students. Four out of five students on the major welfare professional university college programmes such as the nurse programme, the social counsellor programme, and the day-care teacher programme were women in 2011, and two out of three teacher students were women. Figure 2.5 shows the overall rise of women in higher education, and figure 2.6 shows the share of women vs. men at the different higher education levels. The level of business college, a relatively small portion of the overall intake to higher education, primarily educating toward applied jobs in the private sector, is the only that has a majority of men, even though the gap has been diminishing. At the university college level, from near parity between men and women, women make up over two thirds of all entrants to university colleges today. Among those that embark on a university education, the share of female students has been ever rising the last many years. In 1989, 40 per cent all students were women and in 2011 more than 50 per cent of all students were women.

Figure 2.5: Women and men in higher education 1984-2011 (entrants).



Source: Calculations based on register data from Statistics Denmark.

Figure 2.6: The share of women in higher education 1984-2011 (entrants)



Source: Calculations based on register data from Statistics Denmark.

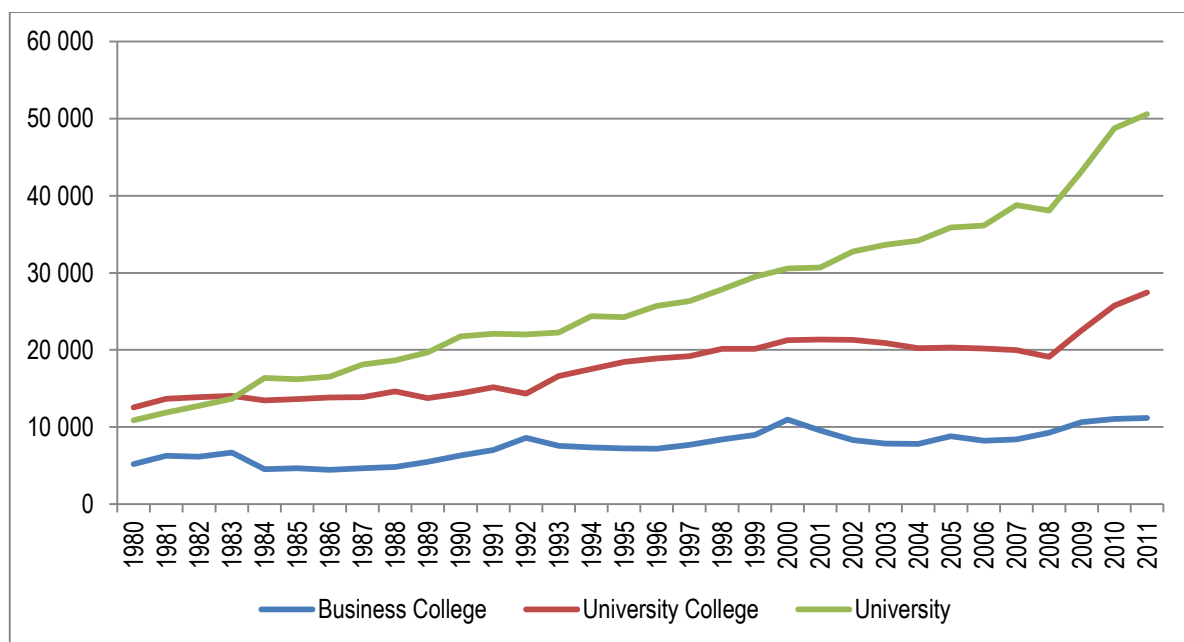
2.5 Types and level of studies

The Danish higher education system consists of three tiers: business academies (short cycle programmes, qualifying primarily for jobs in the private sector, usually 2-3 years), university colleges (medium cycle programmes primarily educating welfare state professionals such as teachers, nurses, child care or social workers, usually 3-4 years) and university institutions (long cycle programmes, consisting of a bachelors and master's degree, with a range of traditional and professional programmes, usually 5 (3+2) years (the vast majority of Danish university students continue to pursue a master's degree)). Of the 15 year olds finishing primary school in 2012, 5 per cent are ultimately expected to finish a business academy degree, 28 per cent a business college degree, and 29 per cent a university degree.

In the Danish higher education system, students are admitted to a specific programme, with relatively fixed subject content. University colleges grant the title of professional bachelor's degree, while universities grant bachelor's, master's and PhD degrees. In general the majority of higher education programmes will admit all qualified students (those with a gymnasium degree, and, in most cases, with some specific gymnasium subjects at specified levels). However, while completion of the gymnasium formally grants access to higher education programmes, the highly sought-after programmes, where demand exceeds supply, almost exclusively found at the university level, will often require a high gymnasium grade point average to gain access. This is the case for about 25 per cent of the study places at university level. These institutions and programmes have a smaller quota granting access to people with alternative entrance qualifications that do not have the grade point average needed to gain entrance through the main admission system.

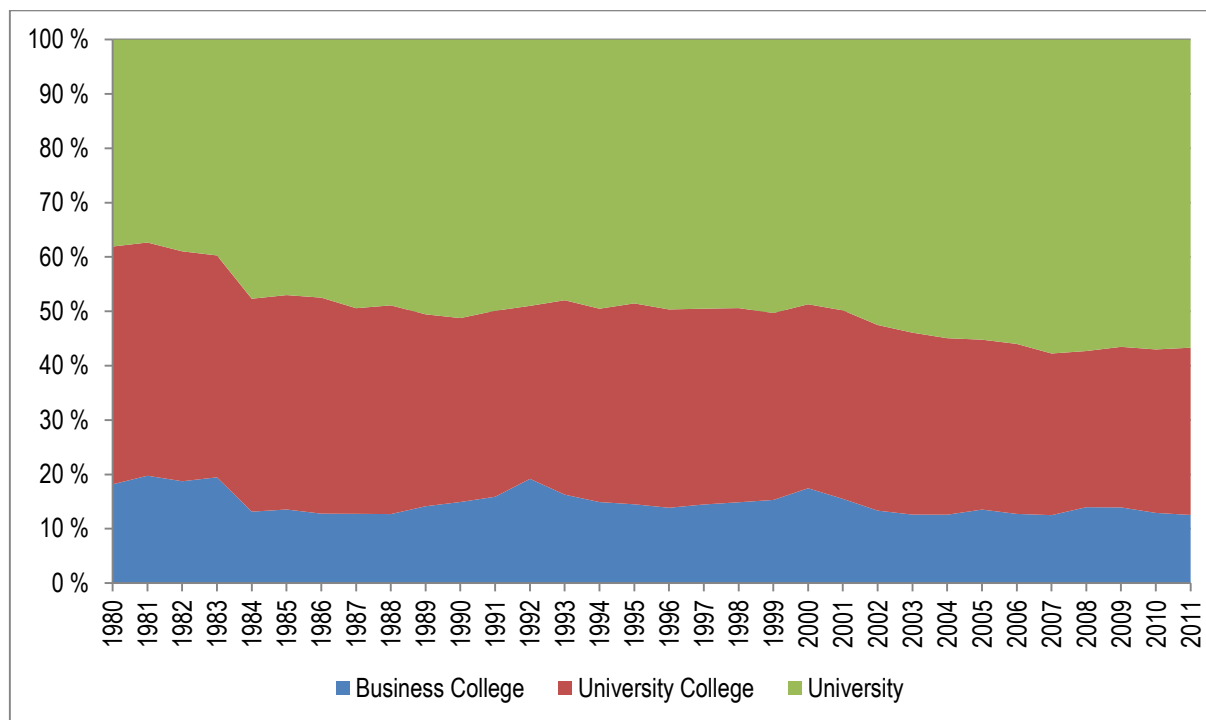
Figures 2.7 and 2.8 depict higher education entrants by level of higher education, in total numbers and as percentages of overall enrolments. The rapid expansion of higher education has primarily been within the university level. Figure 2.7 clearly shows that the largest and most constant increase is among university entrants; those that enrol in a bachelor's programme (of which the vast majority progress into a master's programme).

Figure 2.7: Entrants by level of higher education (Business College, University College, University) 1980-2011.



Source: Register data from Statistics Denmark.

Figure 2.8: Entrants by level of higher education (Business College, University College, University) 1980-2011.

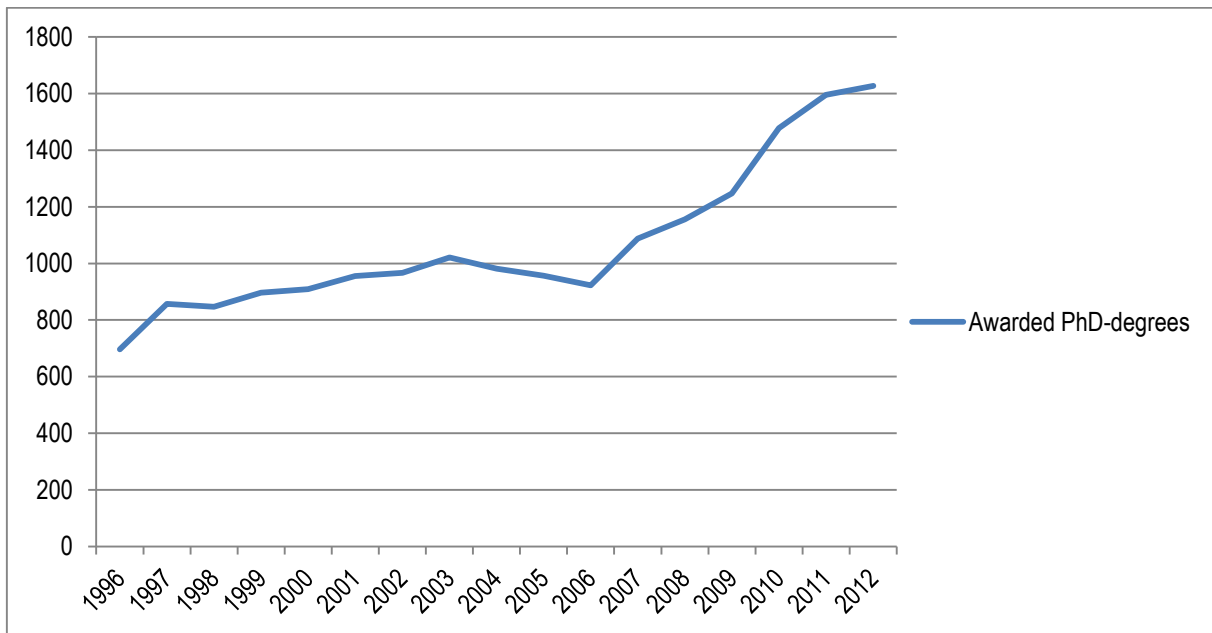


Source: Calculations based on register data from Statistics Denmark.

As figure 2.8 shows, the higher education institutions have not expanded evenly. While the business colleges have had a constant small share of entrants, the universities have expanded their share and university colleges have seen fewer entrants relative to the other higher education institutions. The greater expansion of the universities relative to the university colleges can be seen as an effect of a number of things: since many of the university college institutions have had capacity to admit more students than have applied in the period depicted, the figures also show the relative decrease in popularity of the university college programmes, and the parallel increase in popularity of the university programmes. The university colleges offer professional bachelors level degrees, while the universities have the opportunity to offer the more popular (full time) masters degrees. The university colleges also almost exclusively educate students in welfare professional programmes aimed at occupations in the public sector.

It should also be noted, that there has also been a rapid increase in the number of doctoral students in Denmark, especially from the 1990s onwards. Figure 2.9 shows the rise in doctoral degrees awarded from 1996-2012 (valid Danish PhD data do not go further back than 1996).

Figure 2.9: Awarded PhD degrees.

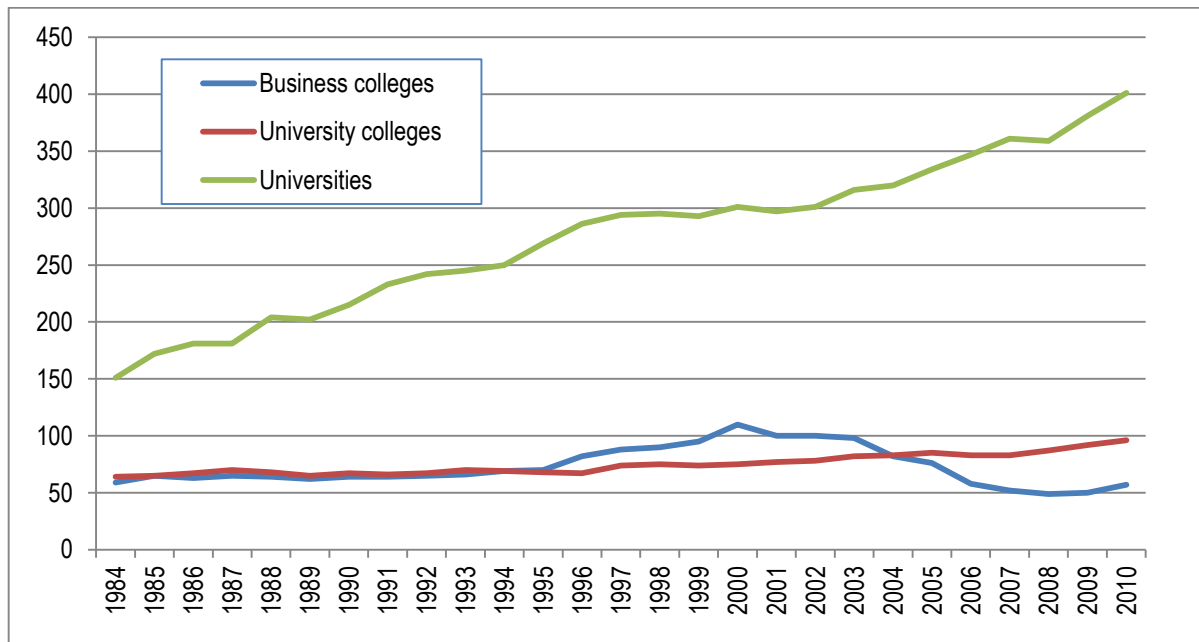


Source: Statistics Denmark

Figure 2.9 illustrates the expansion of the system and the rising educational level among each cohort. Where the PhD degree earlier was reserved for extremely few people, today it has exploded and constitutes a major share of the different possible future occupations within some subfields, especially within the natural and health sciences.

Another way of showing the changes in types of studies chosen, and to explore the differentiation in the higher education system, is to look at the rise in number of uniquely different programmes offered in Danish higher education. Figure 2.10 shows a dramatic increase in unique programmes offered at the university level, while it is much more modest for the university colleges. Among other things, this reflects the changes in labour market demands for, in terms of skills acquired, an increasingly differentiated work force.

Figure 2.10: Increase in unique programmes offered in higher education.



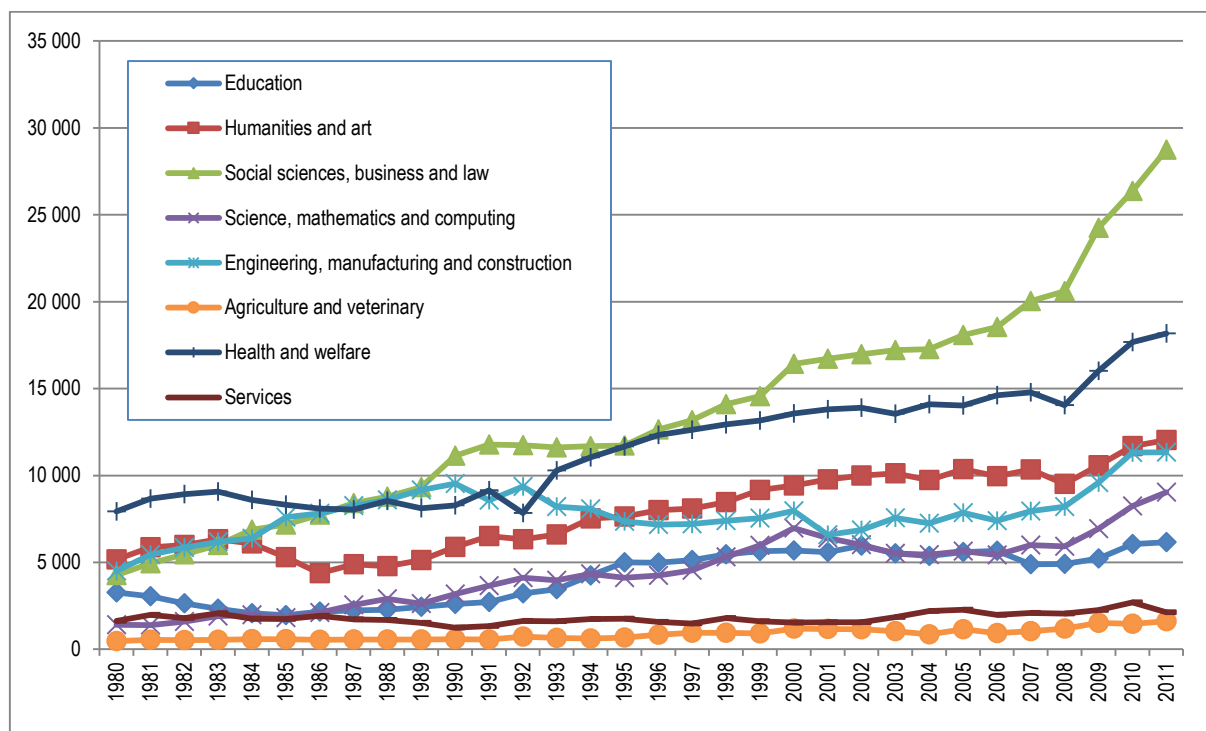
Source: Calculations based on register data from Statistics Denmark.

2.6 Fields of study

2.6.1 A general overview

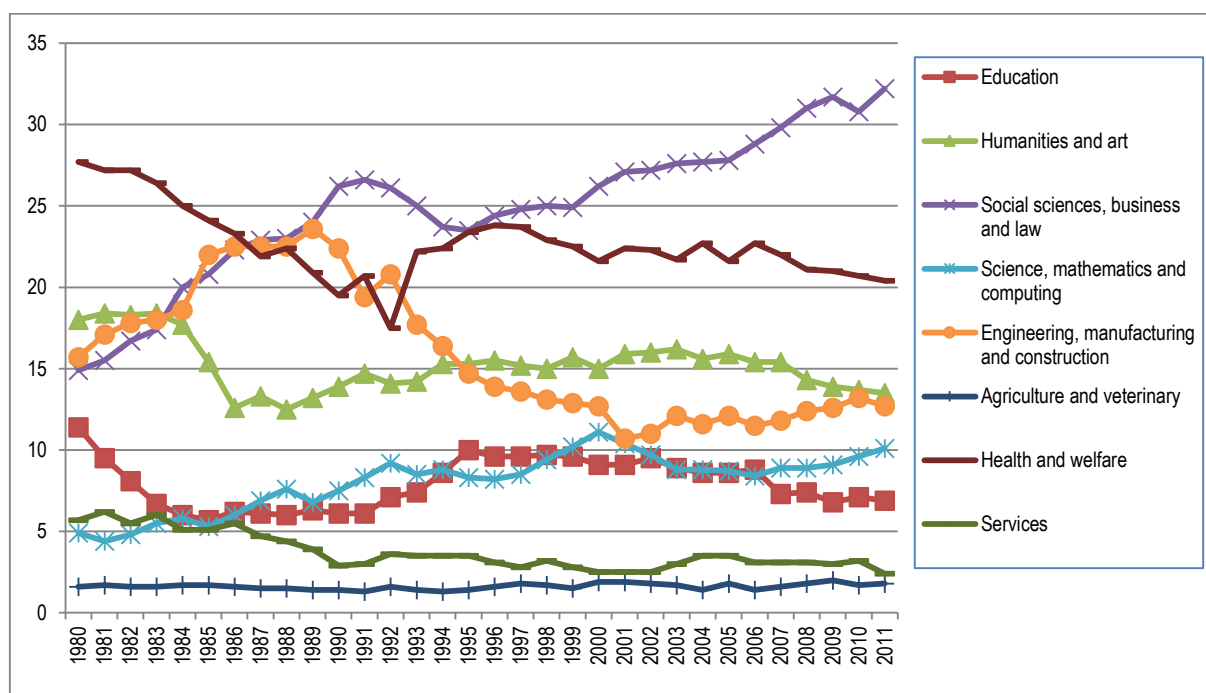
Looking at access to higher education by field of study (ISCED-classification) it becomes apparent that there have been a number of changes on the composition of higher education. In absolute numbers, especially the fields of Social science, business and law and Health and welfare have increased rapidly during the period. At the same time, the field of Agriculture has only seen very modest increases in student numbers. This picture reflects changes in field of study preferences which is again related more or less to changes in the occupational structure and labour market demands. Figure 2.11 shows totals and figure 2.12 shows the changes as percentages of the total entrants.

Figure 2.11: Higher education entrants by fields of study, ISCED fields, 1980–2011.



Source: Register data from Statistics Denmark.

Figure 2.12: Entrants by field of study (broad ISCED fields), 1977–2011. Percentages.



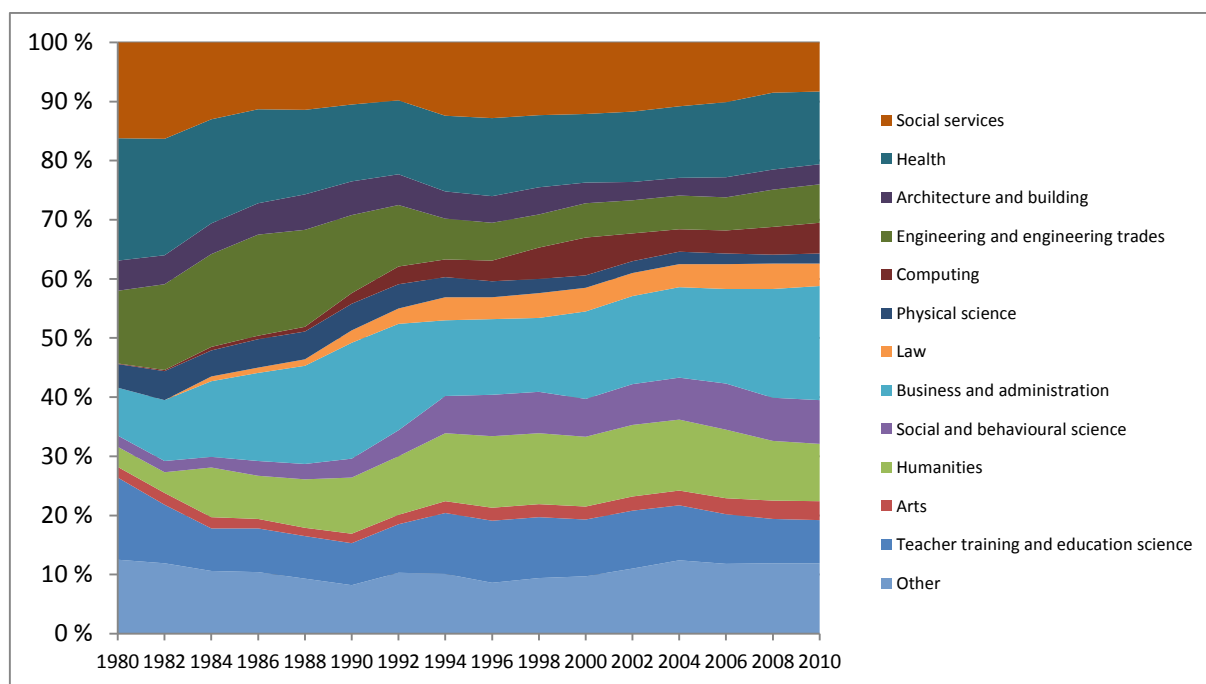
Source: register data from Statistics Denmark.

Except for the field of Veterinary science and agriculture, with a constant share of about 2 per cent, the fields follow different patterns. Most significantly, the fields of Social science, business and law has more than doubled their share of entrants from 1980-2011, from 15 per cent to over 30 per cent. The only other field to increase its share has been the field of Science, mathematics and computing. The fields of Engineering, manufacturing and construction experienced the same sharp increase in the

share of entrants until the end of the 1980s, followed by a decrease, but have risen again from 2001 onwards. In 2011, the fields of Social science, business and law and Health and welfare account for more than half of the students admitted to Danish higher education.

Figure 2.13 shows the different patterns at a more detailed level (narrow ISCED definitions of fields), enabling us to single out fields such as the Teacher programmes and Business studies. Within the Social sciences, law, and business studies are all expanding. A more detailed look at this significant increase reveals that it is especially the field of Business that drives the rise in intake. In 2011, Business studies constitutes a fifth of all entrants, and all in all the Social sciences constitute about a third of all entrants. Within the Arts and humanities, Teacher training drops from 14 per cent to about half, while the Humanities rises to constitute a tenth of all entrants. Engineering also goes down from 12 per cent to 7 per cent and Health also drops, together with Social services (it is especially at the university colleges levels that Health and Social services decrease their shares). As written above, these changes generally reflect changes in both supply and demand – most notably with regard to the field of Business studies, which is a field where many occupations that were previously staffed by more or less unskilled workers, now requires/demands skills at university level. Additionally, the diminishing enrolment rates within the fields of Social services and Health (along with the Teacher programme) reflects the diminishing popularity of the university college level programmes within these fields.

Figure 2.13: Entrants by field of study (narrow ISCED fields), 1977–2011. Percentages.

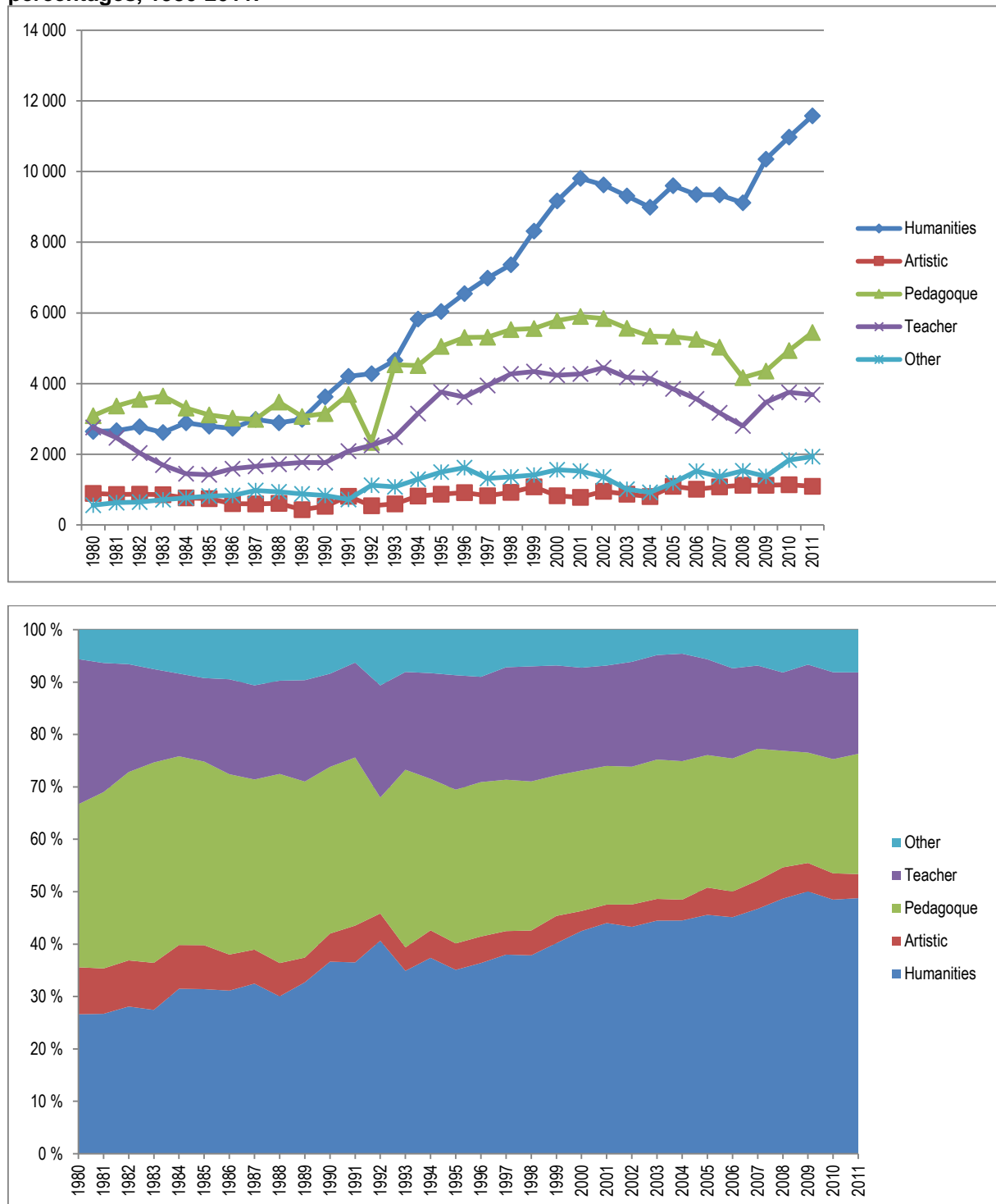


Source: register data from Statistics Denmark.

In the following, a more detailed account is given of the developments within various subfields within the general fields of Humanities and education, Social sciences, business, and Natural and technical sciences, along with the field of Health. The Danish national classification of subfields has been applied, depicting the 6-7 largest subfields within each field, whenever possible (for country comparison. A detailed ISCED classification would have been preferable; however, this is not to be implemented by Statistics Denmark until 2015).

2.6.2 The fields of humanities and educational sciences

Figure 2.14: Entrants within the fields of the humanities and educational sciences, totals and percentages, 1980-2011.



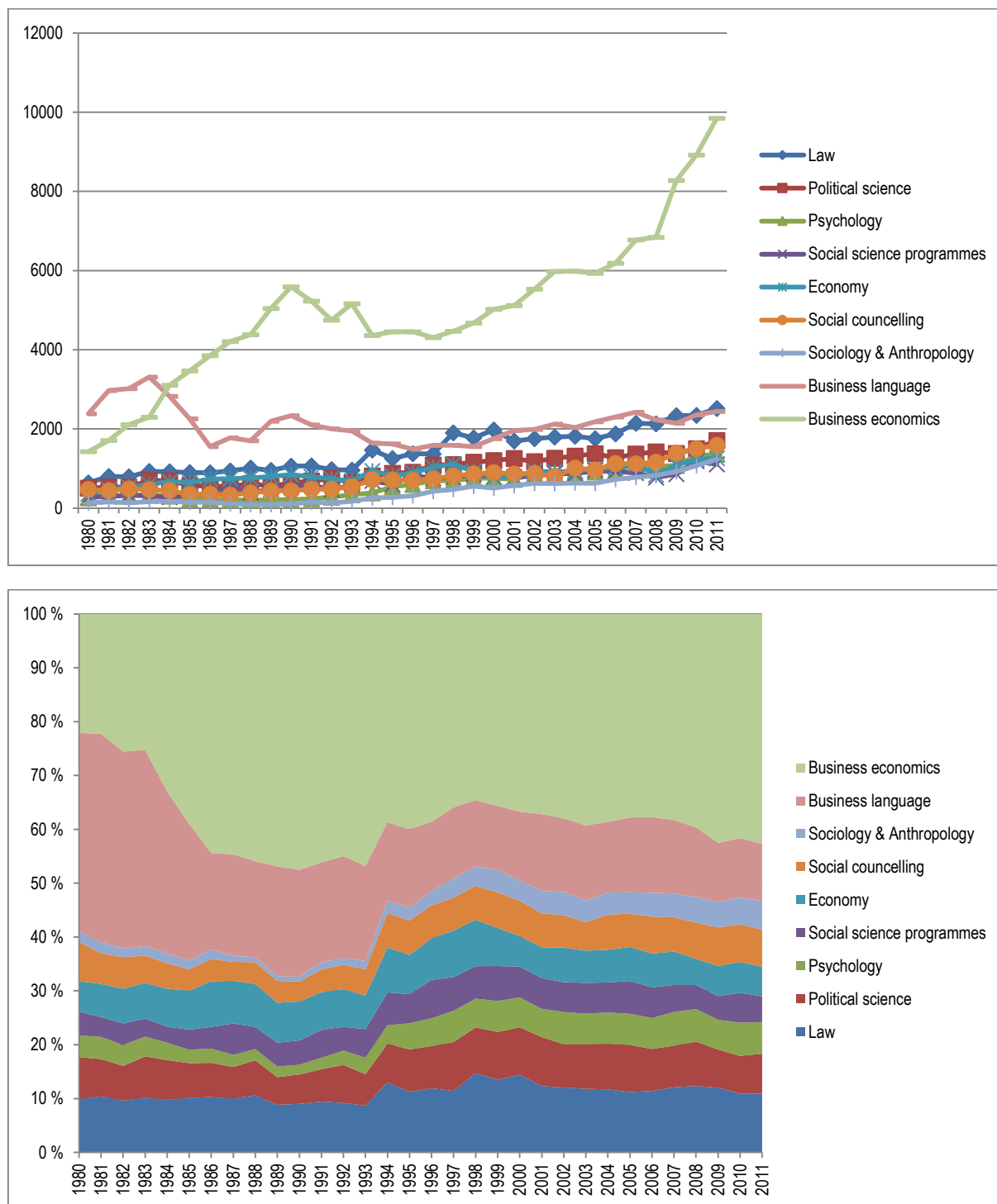
Source: register data from Statistics Denmark.

Figure 2.14 shows the changes in enrolment into the fields of the Humanities and the educational sciences. First of all it is evident that two single university college programmes, the Teacher programme and the Pedagogue programme, constitute the major intakes within this field – more than all other programmes in the Humanities. We can also see that the general enrolment rate is on the rise from 1990 onwards, and with a small drop in 2008 – a picture repeated from figure 2.4. Relatively,

however, the studies in the Humanities increase their share, and the intake to the Teacher programme and the Pedagogue programme is somewhat reduced.

2.6.3 The fields of business and social science

Figure 2.15: Entrants within the fields of business and social science, totals and percentages, 1980-2011.



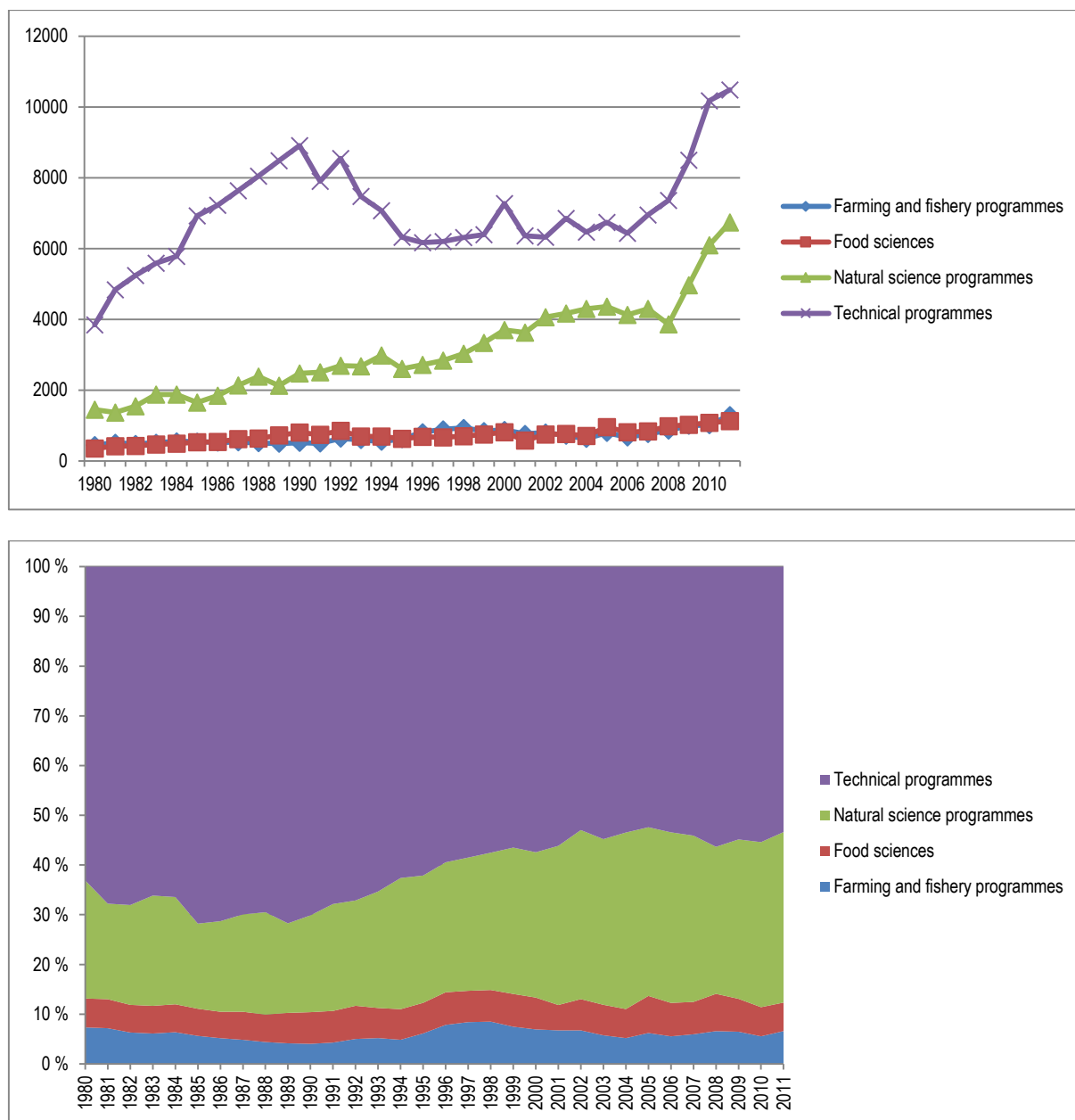
Source: register data from Statistics Denmark.

The most striking development within the fields of Social science and Business is the virtual explosion in Business economics students. As written earlier the Business programmes, and as shown here,

almost exclusively the Business economics programmes, constitute the rise of this field. Depicted as shares, it is also evident that more than 40 per cent of all new students embark on a Business economics programme.

2.6.4 The fields of natural and technical sciences

Figure 2.16: Entrants within the fields of natural and technical sciences, totals and percentages, 1980-2011.

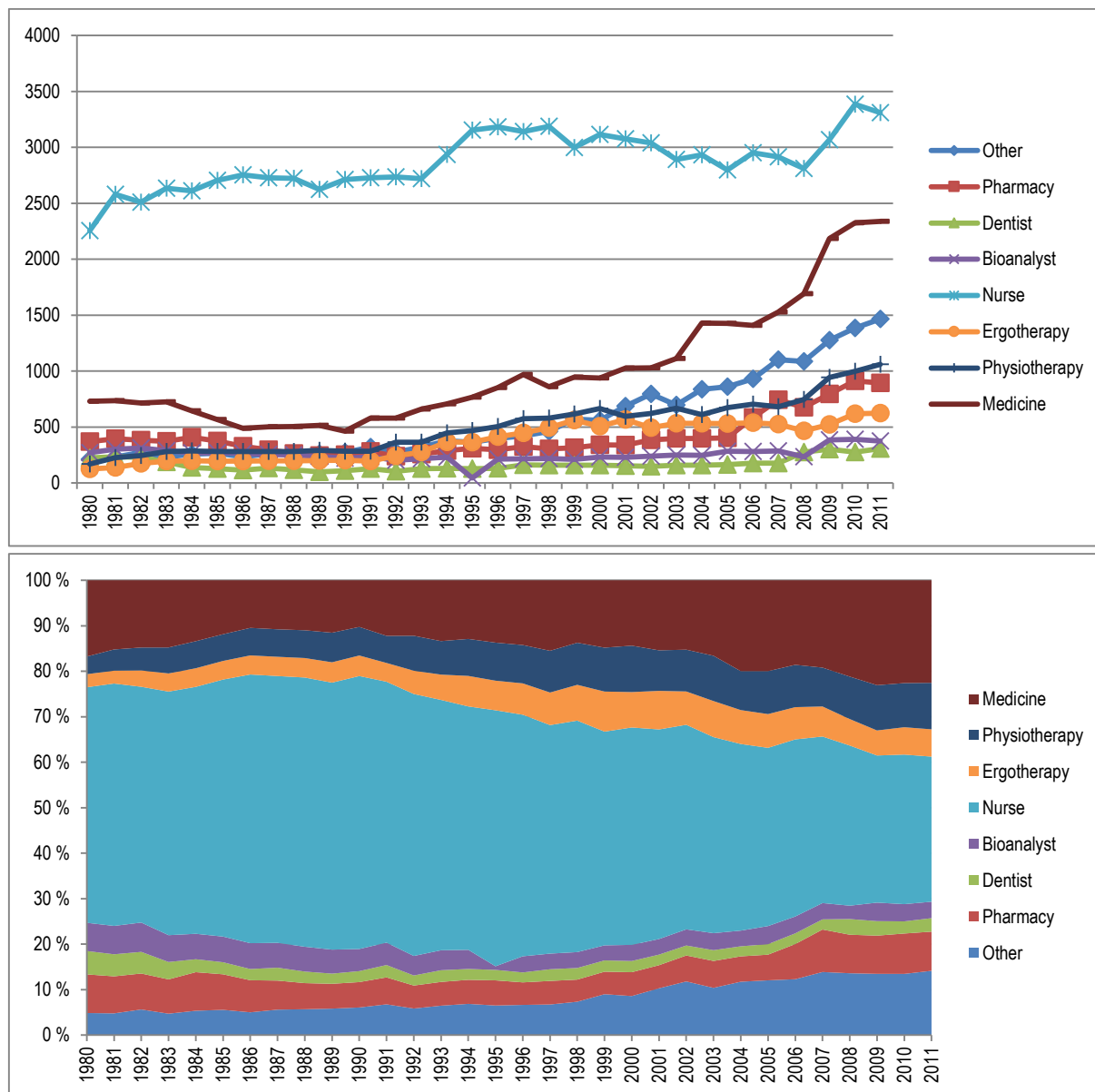


Source: register data from Statistics Denmark.

The changes in the intake to programmes within the fields of Natural and Technical sciences show that Technical and Natural science constitute the larger subfields within this field, and furthermore that the Technical programmes, of which Engineering constitutes a major part, loses ground to the Natural sciences programmes, when seen in relation to the whole field Natural and Technical sciences .

2.6.5 The field of health

Figure 2.17: Entrants within the field of health, totals and percentages, 1980-2011.



Source: register data from Statistics Denmark.

Figure 2.17 shows the development in enrolment to the seven biggest subfields within the field of Health. When we look at the development within the field of Health, we see that the major part of the intake is to the Nurse programmes, with a far larger number than any of the other programmes. Though it has also risen over the years, it is not nearly as striking as the development within the Medicine programmes. In absolute numbers, it is clearly visible that the Nurse programme is by far the largest within the field of Health, and that the Medicine programmes experience a rapid rise in enrolment in the period 1980-2011. Relative to the whole field, we see that the Medicine programmes increase their share and make up about a fifth of all higher education entries into the field of Health. The Nurse programme on the other hand, decreases its share significantly in the period. Additionally, the subfields of Ergotherapy and Physiotherapy increase in numbers over the years, constituting about a tenth of all entrants in the field of Health in 2011.

2.7 Internationalisation

The number of Danish nationals studying abroad, either as part of their programme or as study for a full degree programme abroad, has been on the rise in recent years. In terms of shares of the total number of higher education students, foreign students in Denmark make up an increasingly bigger share of all students. Foreign students seeking a full degree in Denmark has gone up from about 2 per cent in 2001 to over 8 per cent in 2011 while the corresponding number for foreign students studying some of their degree in Denmark has doubled from 2 to 4 per cent (Ministeriet for Forskning, Innovation og Videregående Uddannelser, 2013). The figures are somewhat lower for Danish nationals going abroad: students studying parts of their degree abroad has gone from 2 per cent in 2001 to just under 4 per cent in 2011, while the share of students embarking on a full degree has remained stable over 10 years – about 2 per cent. All in all, more international students are coming to Denmark than there are Danish students going off to study abroad. It is far more common for a Danish university student to go abroad than it is for university college and business college students. The five most popular countries for Danish students seeking a full programme abroad are, in descending order, UK, Sweden, USA, Norway and Germany. Foreign students, studying a full programme in Denmark, most often come from Norway, Germany, Sweden, Romania, Lithuania (Ministeriet for Forskning, Innovation og Videregående Uddannelser, 2013).

2.8 Conclusion

Recruitment patterns in Danish higher education have undergone some major changes since the Second World War. First of all the system has been marked by a massive expansion of institutions and students. Two great waves can be identified here: one in the 1960s fuelled by a dual policy aim of obtaining a more qualified work force, and of addressing the question of equality of educational opportunity. The next great wave was not as explosive as the first (and in that sense maybe less of a wave) but was more characterised by a steady rise in enrolment viewed in relation to the share of a youth cohort embarking on a higher education programme. This expansion has been going on since around 1989 onwards. Universities in particular have been harbouring this expansion, while expansion of university colleges and business colleges, albeit substantial, has been more modest. We have also witnessed a rise in number of different programmes offered (again, especially at the university level) and a rise in the number of institutions offering higher education programmes. This institutional expansion has been somewhat hidden though, after recent mergers have led to a drop in number of institutions. Women have seized the opportunity to gain a higher education degree to the extent that they outnumber men today – a historically unprecedented situation.

The preferences of students have also changed. The fields of Social science, Business and Law have doubled their share of entrants from 1980-2011, from 15 per cent to over 30 per cent. A more detailed look at this significant increase reveals that it is especially the field of Business that drives the rise in student intake. In 2011, Business studies constitutes a fifth of all entrants. All in all, the fields of Social science, Business and Law and Health and Welfare account for more than half of the admitted students in Danish higher education. Some fields have experienced decrease in popularity. The number of entrants to Teacher training has halved from 14 per cent to 7 per cent, and the same goes for Engineering, from 12 per cent to 6.5 per cent. While the rise in Business studies must be seen in conjunction with labour market changes and massive expansion of business schools, the drop in the Teacher programme and Engineering programme probably owes more to a lack of applicants. While teacher training has failed to gain popularity, Engineering has again been on the rise in recent years.

2.9 References

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3 Finland

Sakari Ahola & Juha Hedman

3.1 Introduction

This chapter outlines Finnish developments regarding expansion of, and recruitment to, higher education mainly from the 1950s to present day. The first part looks at the overall expansion in student numbers, breaking down by gender, including also some information on participation rates. The following sections give a more detailed account of the types and levels of higher education and of the expansion of different fields of study. Section 3.6 looks at the evolution of the institutional landscape, offering a typology of the Finnish institutional structure, and tracing the directions of expansion at the institutional level. Finally, there is a short account of the internationalisation of Finnish higher education.

3.2 The policy context

The policy context in Finland in the 1950s and 1960s was characterised by rapid social and economic change. During that time a specific higher education policy took shape, and the role of higher education in social development and workforce production became more important. Expansion was partly planned e.g. by passing a special Development Act of Higher Education, and partly by unplanned reaction to the growing demand and the uncontrolled expansion of secondary education.

In Finland regional policies played an important role in the expansion process. It was an established national policy, relating to the overall policy of equality of educational opportunity, that the number of study places should correspond with the size of the young age cohorts in the regions. Local political struggles added a flavour to this overall policy. Finland carried out two major educational reforms during the 1970s and 1980s as a response to the effects of expansion in the system as a whole. First the nine-year comprehensive school was established by combining the old dual basic education system. Next the relatively scattered secondary vocational education system was reorganised, partly as a response to the consequences of the former reform. This led to a grounding principle of expansion stating that there should be enough study places in vocational and higher education for the entire age group.

The whole educational policy climate changed, however, in the late 1980s with the winds of neo-liberalism and the new “blue-red” government which took office in 1987. The broader issues included overall efficiency and the rationalisation of the network, steering and administration of educational institutions. Second, it involved questions of quality. The common objective of all reforms was to raise educational standards and to improve the quality of instruction in order to meet the needs of

international competition. This specifically included the aim of developing and increasing higher education. This eventually led to the founding of the AMKs in the early 1990s.

The new policies of higher education emphasising efficiency, quality, managerialism, internationalisation and the need for structural rationalisation strengthened its grip during the 2000s. The Bologna process, and the related degree reforms, which included also far reaching curricular reformatations, took most of the attention during the first part of the decade. Finally, the "big" university reform in 2009 made a profound change in the university-state relationship. Universities were separated from the state, and currently they are either independent legal entities under public law or foundations under private law. Administrative changes increasing managerialism and the role of outsiders in university governance result, however, from a longer, gradual development. The reform included also important institutional mergers. More detailed information on these changing policy contexts is included in section 3.6.

3.3 Expansion of the system

In Finland the expansion of the higher education system has advanced in three broad phases. First, there was steady growth during the first part of the 20th century. Then came the education explosion after the Second World War, and then the second explosion in numbers when a new type of higher education institutions, the AMKs², was established during the 1990s. In the following figure the overall expansion is shown in terms of enrolled new students. The figure also shows the intake in relation to the cohort of 19 year olds. Since 2000, as the AMKs have fully established themselves, the system can accommodate roughly 70-75 per cent of the age group. The figure shows that expansion has not been continuous but there are periods of halt and stagnation, first from 1965 to 1970 and then from 1975 to 1985. At the same time, however, the *lukio* kept on growing, causing the phenomenon of matriculation backlog (see 3.6.1.). Since the beginning of the 2000s the official policy has been not to expand the system any more, but rather to accommodate the excess demand by rationalising the system. The total number of university students is currently 168,000 and AMK students 144,000.

² The AMK model was close to the German *fachhochschule* (*ammattikorkeakoulu* in Finnish) In English texts these institutions are usually referred to as *polytechnics* but Ulrich Teichler has repeatedly pointed out that it is a misleading term regarding the nature of the AMKs (e.g. OECD 1995). The AMKs themselves have nowadays adopted the term *universities of applied sciences*. In this report we will use the Finnish abbreviation AMK. See 3.6.1.

Figure 3.1: Number of new enrolled students and their share of 19 year olds in 1900-2012.

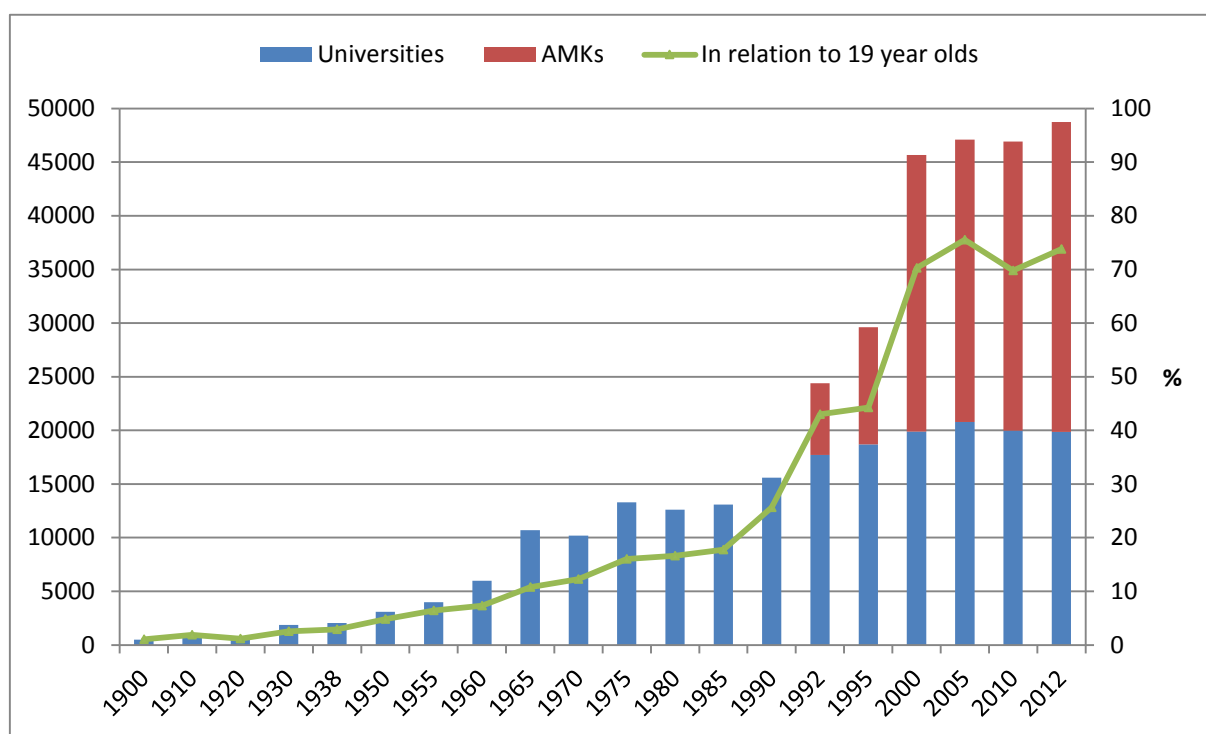
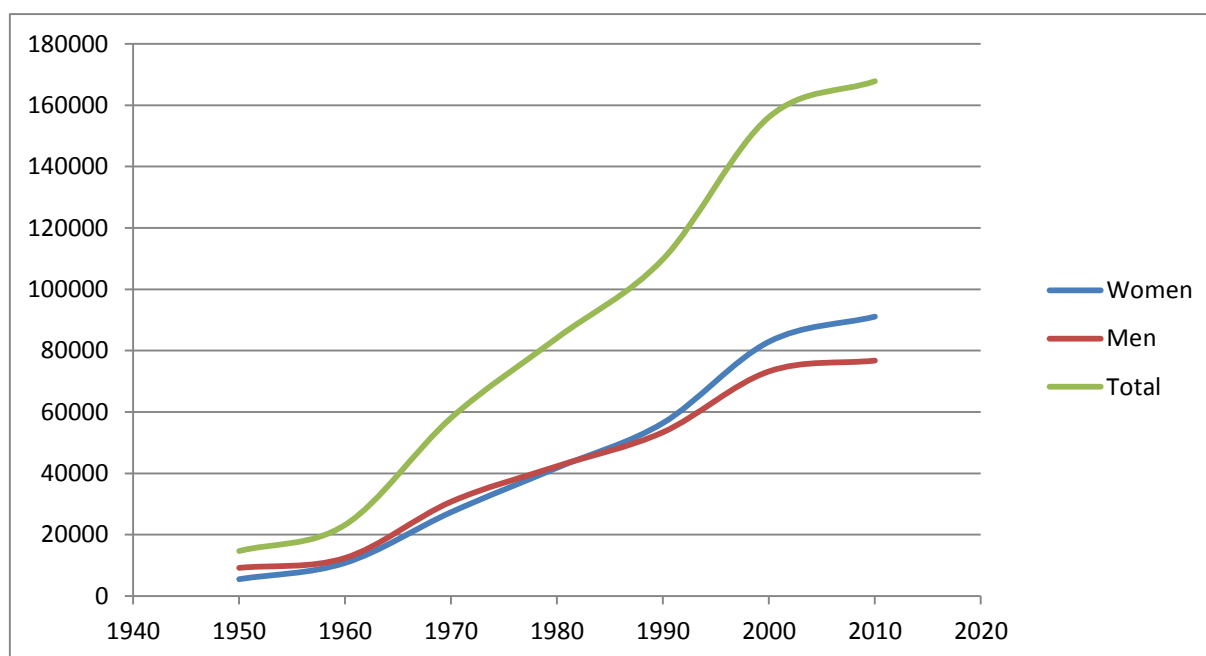


Figure 3.2: Number of registered university students 1950 to 2010 also specified by gender.

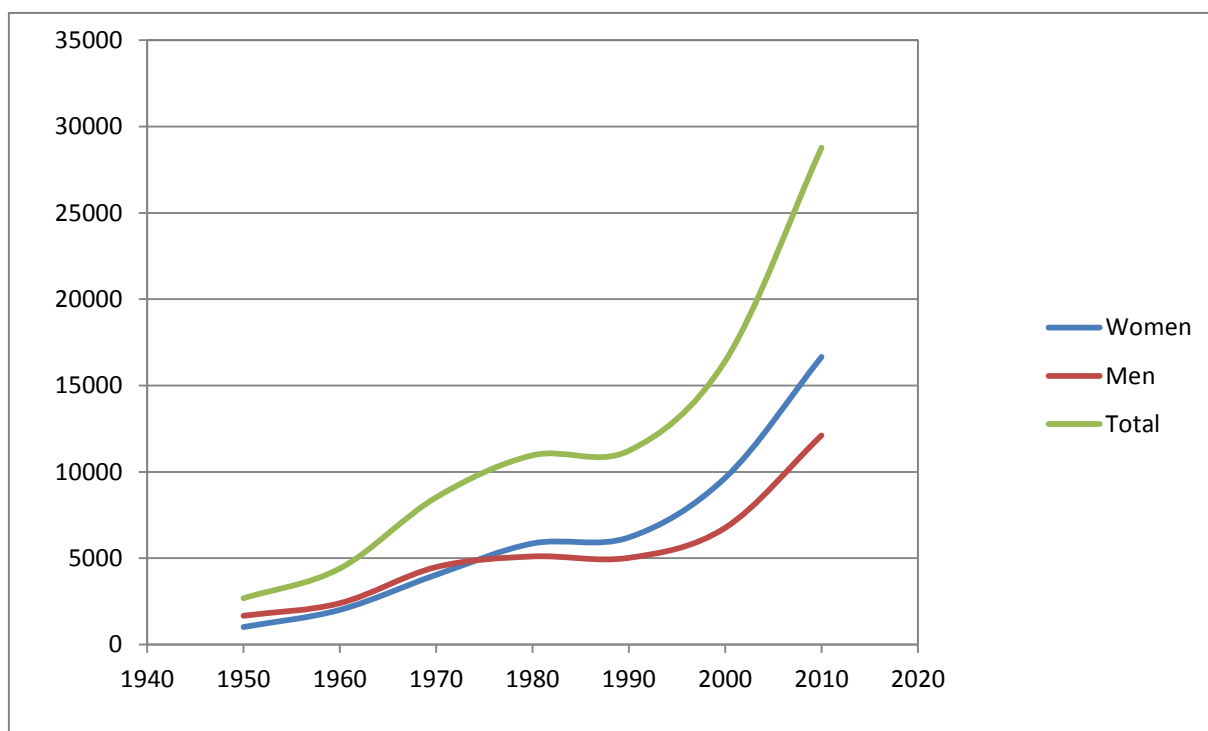


Sources: Statistical yearbook of Finland 1951: tables 301-308, Statistical yearbook of Finland 1960: tables 329-330, Statistical yearbook of Finland 1970: tables 345-347, Statistical yearbook of Finland 1992: tables 395-397, Statistical yearbook of Finland 2000: tables 328-332, Statistical yearbook of Finland 2011: tables 381-384.

The total number of registered university students has increased steadily from 15,000 in 1950 to 168,000 in 2010. During the period from the 1960s to the 1990s the increase in number of registered students is clearly more rapid than in preceding and following periods. The number of women university students rose somewhat more rapidly than the number of men, so that in the 1980s the number of

women surpassed that of men. The number of women university students in 1950 was 5,500 and in 2010 it was as high as 91,000. Men's respective numbers are 9,200 and 77,000.

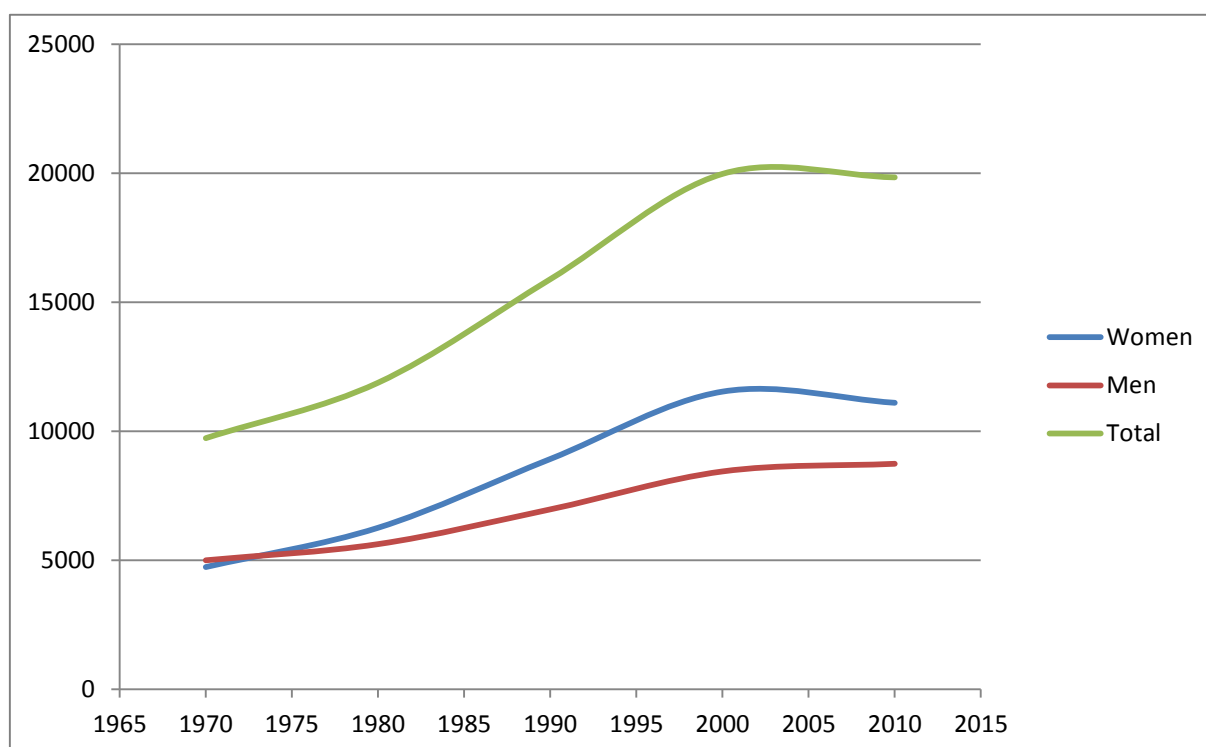
Figure 3.3: Number of university graduates 1950 to 2010 also specified by gender.



Sources: Statistical yearbook of Finland 1951: tables 301-308, Statistical yearbook of Finland 1960: tables 329-330, Statistical yearbook of Finland 1970: tables 345-347, Statistical yearbook of Finland 1981: tables 328-331, Statistical yearbook of Finland 1992: tables 395-397, Statistical yearbook of Finland 2000: tables 328-332, Statistical yearbook of Finland 2011: tables 381-384.

The total number of university graduates has increased steadily from 3,700 in 1950 to 29,000 in 2010. During the period from the 1990s to the 2010s the increase in number of graduates is clearly more rapid than in preceding period. The number of women university graduates has risen somewhat more rapidly than number of men, so that in the 1970s the number of women surpassed that of men. Number of women university graduates in 1950 was 1,000 and in 2010 it was already 17,000. Men's respective numbers are 1,700 and 12,000.

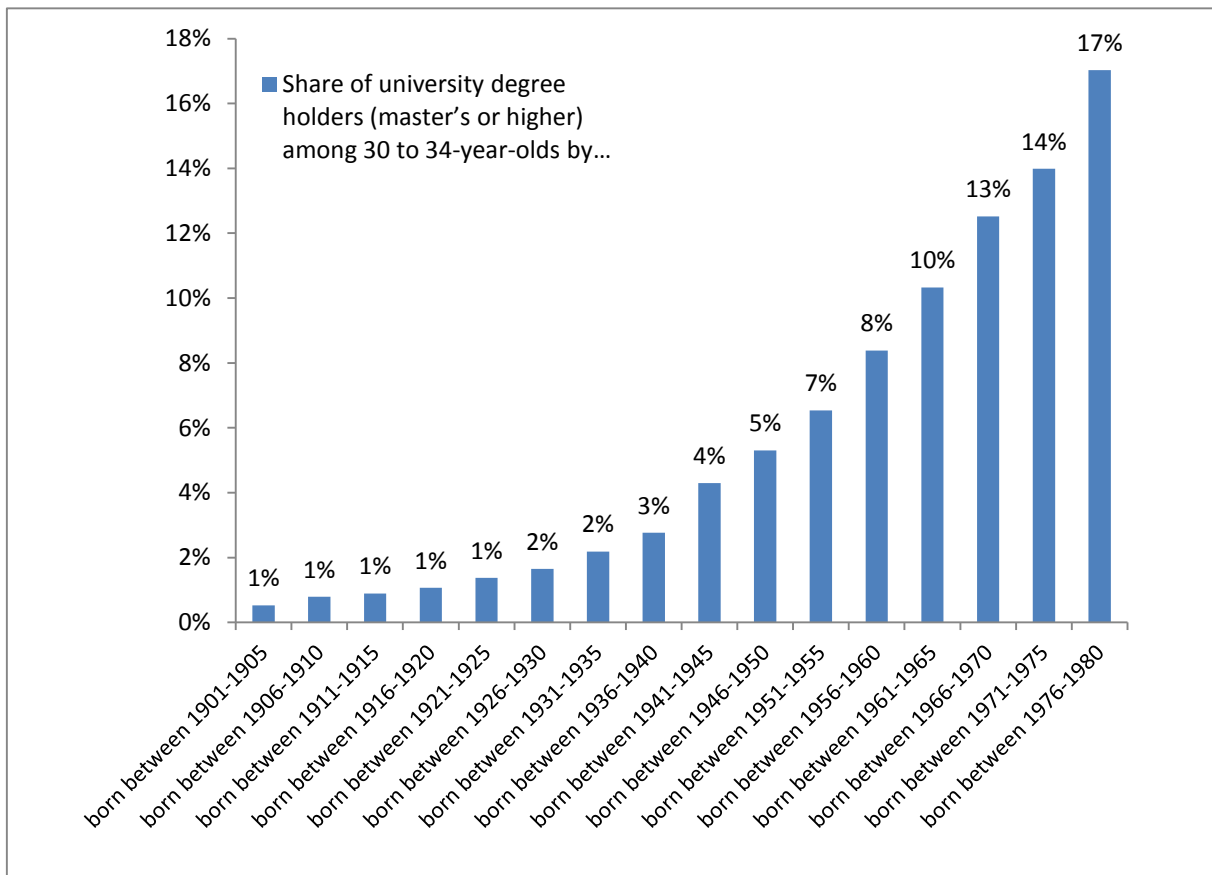
Figure 3.4: Number of new university students 1970 to 2010 also specified by gender.



Sources: Statistical yearbook of Finland 1970: tables 345-347, Statistical yearbook of Finland 1981: tables 328-331, Statistical yearbook of Finland 1992: tables 395-397, Statistical yearbook of Finland 2000: tables 328-332, Statistical yearbook of Finland 2011: tables 381-384.

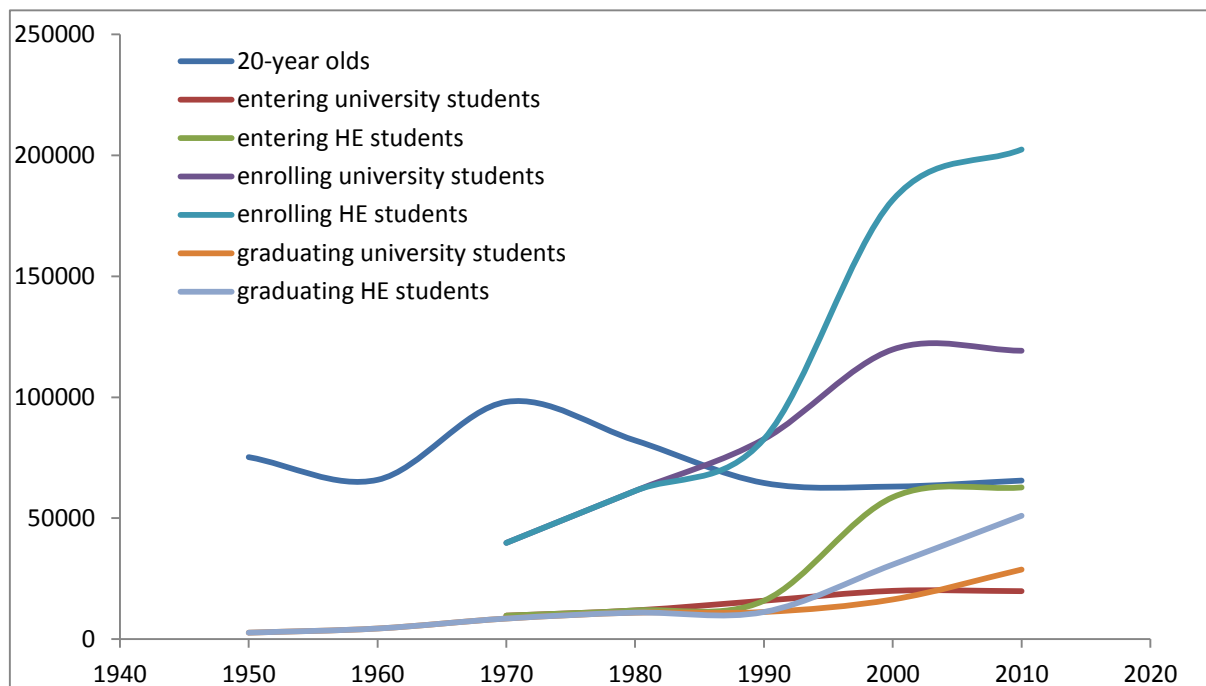
The total number of new university students has increased steadily from 9,700 in 1970 to 20,000 in 2000 and remained at that level also in 2010. The number of women surpassed that of men already in the 1970s and the difference between the number of women and men has widened up until 2000, when the numbers of both women and men ceased to rise. The number of new women university students in 1970 was 4,700 and in 2010 it was 11,000. Men's respective numbers are 5,000 and 8,700.

Figure 3.5: Share of university degree holders (master's or higher) among 30 to 34-year-olds by year of birth.



When looking at the development in the share of university degree holders among 30-34 year olds by year of birth, we see that the share has grown exponentially as regards those born during the previous century. From those born in the start of the 20th century less than 1 per cent held a master's degree (or higher) – the basic university degree in Finland – at the ages of 30 to 34. Age group by age group the share has climbed so that of those born between 1976 and 1980 a 17 per cent share held a university degree at age 30 to 34.

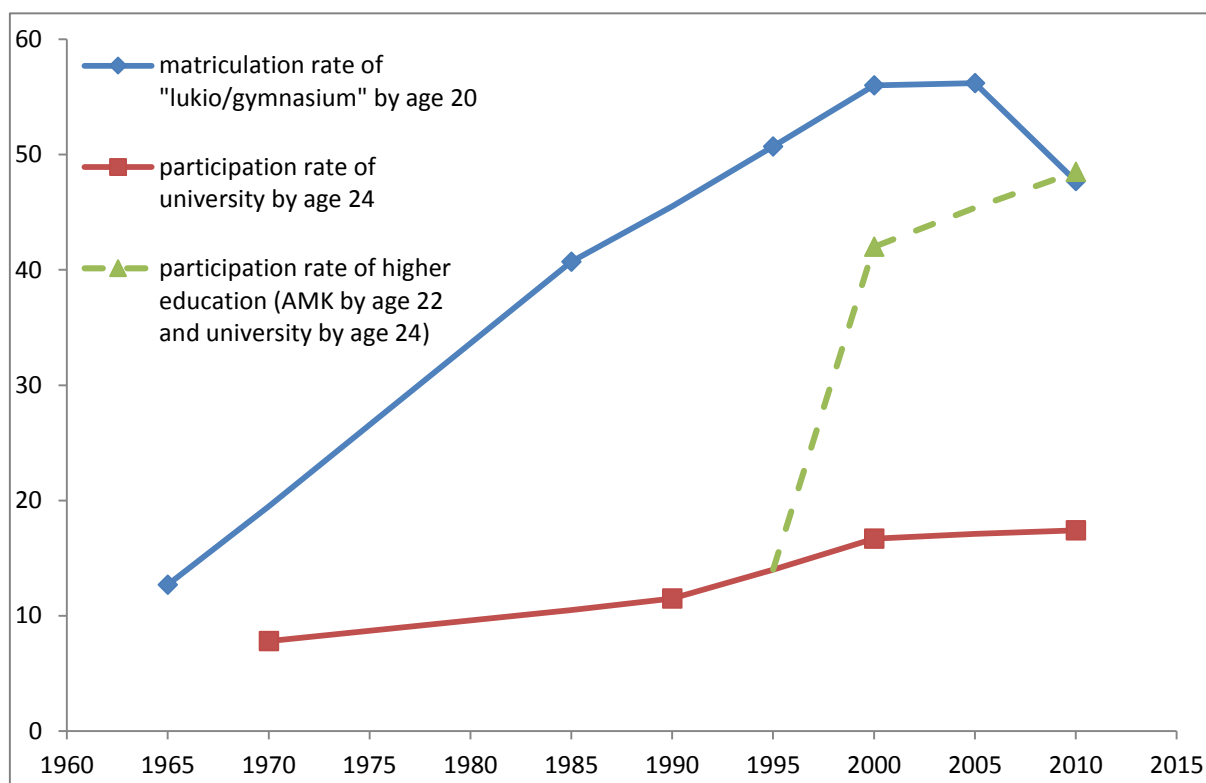
Figure 3.6: Number of 20 year olds students by status: enrolling, entering and graduating higher education (AMK + university) and university students 1950–2010.



Sources: Statistical yearbook of Finland 1951: tables 301-308, Statistical yearbook of Finland 1960: tables 329-330, Statistical yearbook of Finland 1970: tables 345-347, Statistical yearbook of Finland 1981: tables 328-331, Statistical yearbook of Finland 1992: tables 395-397, Statistical yearbook of Finland 2000: tables 328-332, Statistical yearbook of Finland 2011: tables 381-384.

The Finnish “baby-boomers” turned twenty in the late 1960s and early 1970s. At the time the number of university students enrolling was 40,000. The number of entering as well as graduating university students stood at 10,000. Since then the size of 20 year old age groups decreased until the 1990s and stabilised at around 65,000 from there on. The number of enrolling university students in turn has continued to increase until the turn of the millennium, when it seems to have stabilised around 120,000. The launch of the AMKs in 1990s rocketed the number of enrolling students to 200,000, i.e. twice the size of baby-boomer age groups and three times the size of current age groups. Also due to the launch of AMKs the number of entering students rocketed to 60,000 in the early 2000s and seems to have stabilised around that level; also the number of graduating students has turned into a rather steep incline from the 1990s onwards. It should be noted that the number of students entering university shows a rather slight increase throughout the period from 1970 to 2010. Likewise, the number of students graduating from university has remained stable until the 2000s, when the Bologna process started to take effect in Finnish universities.

Figure 3.7: Matriculation (from “lukio/gymnasium”) rates by age 20 and participation (in higher education) rates by age 22 in AMKs and 24 in universities from the 1960s to the 2010s



Source: Kivinen, Hedman and Kaipainen 2012.

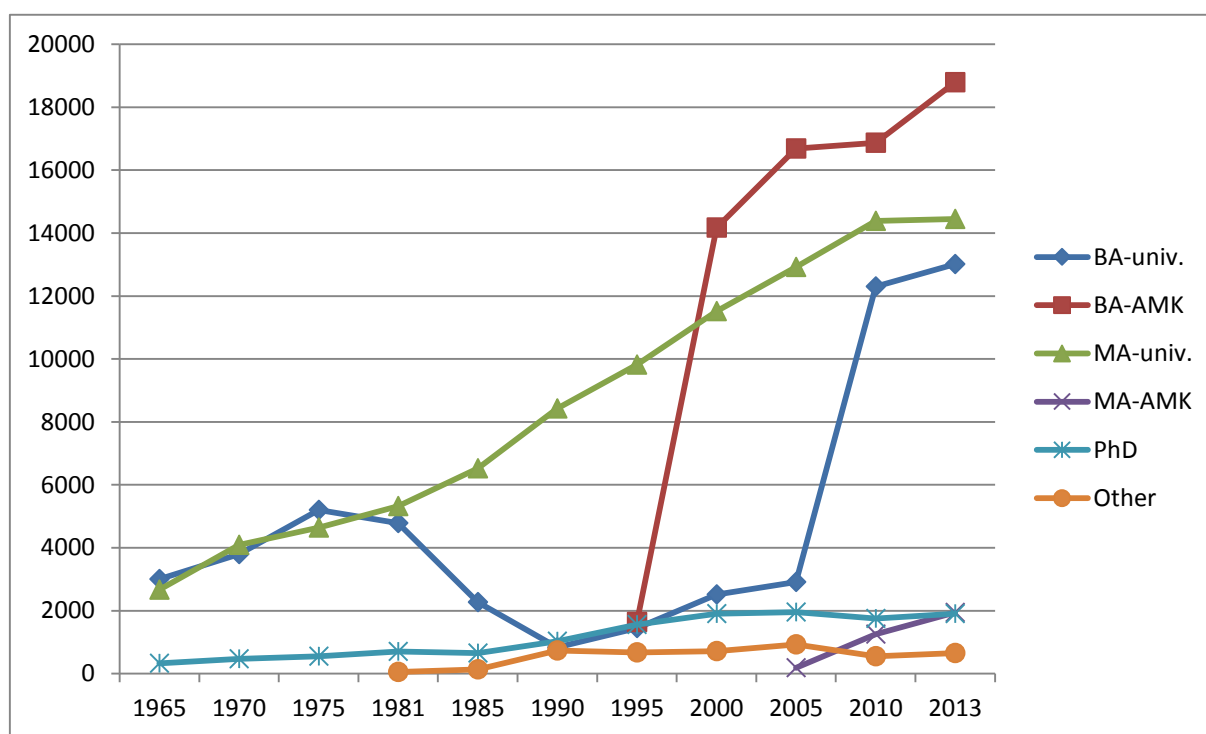
In Finland the mode age of AMK students is 22 years and that of university students 24. The mode age of graduates of secondary education is 19. A 13 per cent share of 19 year olds in 1965 had matriculated from “*lukio/gymnasium*”. The respective matriculation rate (MR) in 1985 was already as high as 41 per cent and in the start of the 2000s it reached its peak at 56 per cent. From the 24 year-olds in 1970 an 8 per cent share had attended university. In 1990 the respective participation rate was no higher than 12 per cent. The university participation rate has also stayed at the rather moderate level of 17 per cent in the 2000s. However, with the launch of the AMKs the higher education participation rate rocketed to 49 per cent in 2010. The matriculation rate of 48 per cent in 2010 suggests that the higher education participation rate could be turning into a decline in the 2010s. It is however important to keep in mind that matriculation no longer gives higher education eligibility to the same extent as in previous decades. Increasingly, young people from vocational education also participate in higher education.

3.4 Type and level of studies

In the Finnish system the “type” of studies is usually attached to the division between the two sectors of higher education, the universities and the AMKs. In the Finnish discussion this is still interpreted as a dual system (cf. Kyvik 2004). In the statistics the usual reference is to the levels. In the following figure the expansion, in terms of degrees³, follows these two conceptualisations. In line with the current Bologna vocabulary we can speak of bachelor’s level degrees and master’s level degrees, which nowadays exist in both sectors. Postgraduate degrees (including also the old licentiate degrees) can be earned only in the university sector. In addition there are some professional types of degree in the university sector (e.g. the specialist degree in medicine).

³ The division for registered students is available only from 1981 as the KOTA database was established then.

Figure 3.8. Number of degrees by level and sector, 1965-2013



In terms of the university master's degree, which is still the basic university degree, there is a steady growth until the beginning of 2010s. Bachelor-level degrees, on the other hand, were as frequent as MAs up to the 1970s but after that their number dropped radically. In the fields of humanities and natural sciences, for instance, bachelor degrees had been introduced in the 1950s for the growing needs in the field of secondary school teaching. These "intermediate degrees" were abolished in the big curricular reforms of the 1970s and then re-introduced in the early 1990s – before the Bologna process started. One of the reasons behind was the need, highlighted by the increasing internationalisation, to create a comparable degree that would allow Finnish graduates to participate in international master's programmes. One practical reason was the need to reduce dropout rates. At that time, without any reference to the questions of employability, the Ministry considered it better to exit from higher education with some degree than without any degree. The Bologna degree reform made then the lower degrees obligatory in all fields except medicine: hence the huge growth from 2005 to 2010. Regarding AMKs we can again see the growth as the institutions were established during the 1990s. Currently the number of basic AMK degrees exceeds the number of university master's degrees.

In the AMK sector the Bologna process resulted in launching of the second cycle degrees in 2002. In 2013 there were 8,566 students studying these second cycle degrees, and the number of completed degrees was 1,948. In the 2003-2008 Development Plan the Ministry set as a long term objective that second cycle degrees will be offered to about 20 per cent of AMK graduates.

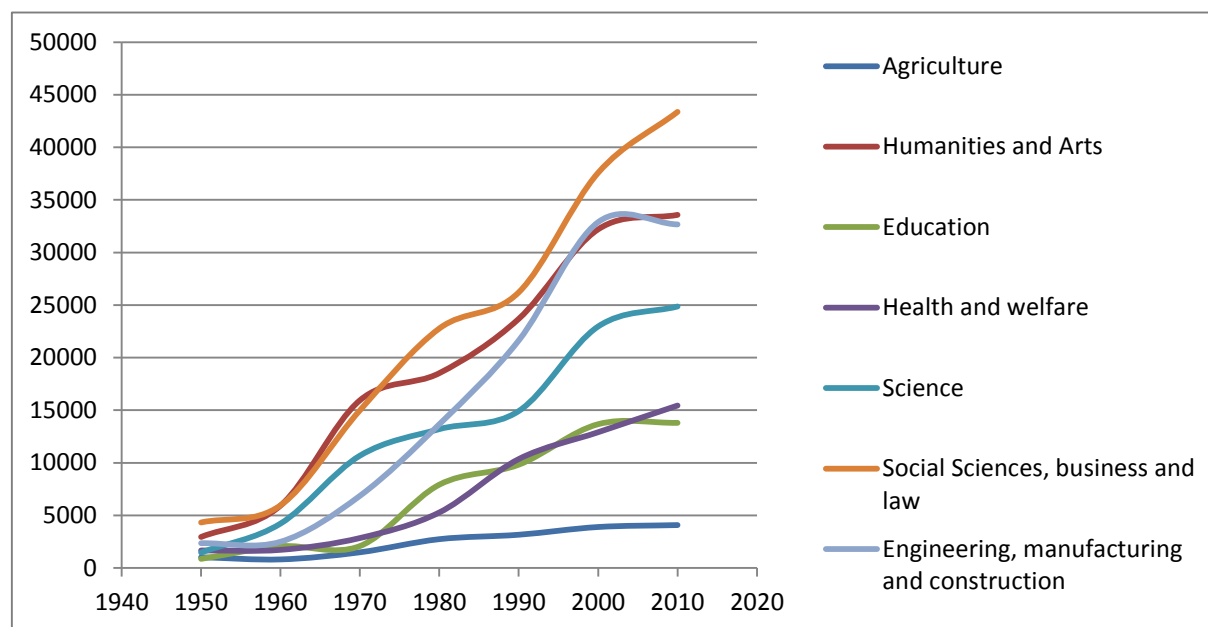
3.5 Fields of study

3.5.1 General overview

In the following section we describe the development in the numbers of registered students, entrants and graduates in Finnish universities between 1950 and 2010 by seven broad fields of study. When measured by number of registered students in 1950 Social sciences, business and law together was the largest field of study with 4,300 students, accounting for 30 per cent of all registered students. In 2010 the Social sciences, business and law is still the largest field now with 43,400 students, which is 26 per cent of all students. The smallest field ever since 1960 has been Agriculture and veterinary science. In

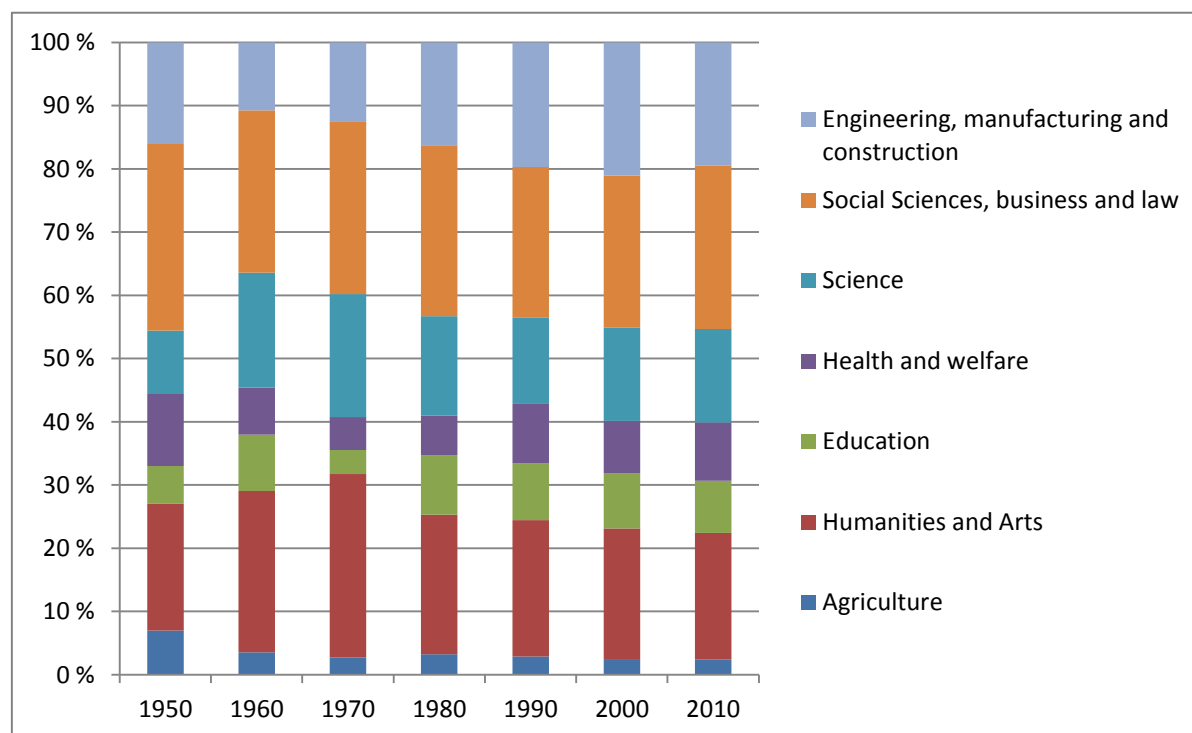
the fields of Education and Health and welfare the number of registered students started to rise more steeply from 1970 onwards.

Figure 3.9: Number of registered university students by seven broad fields of study from 1950 to 2010.



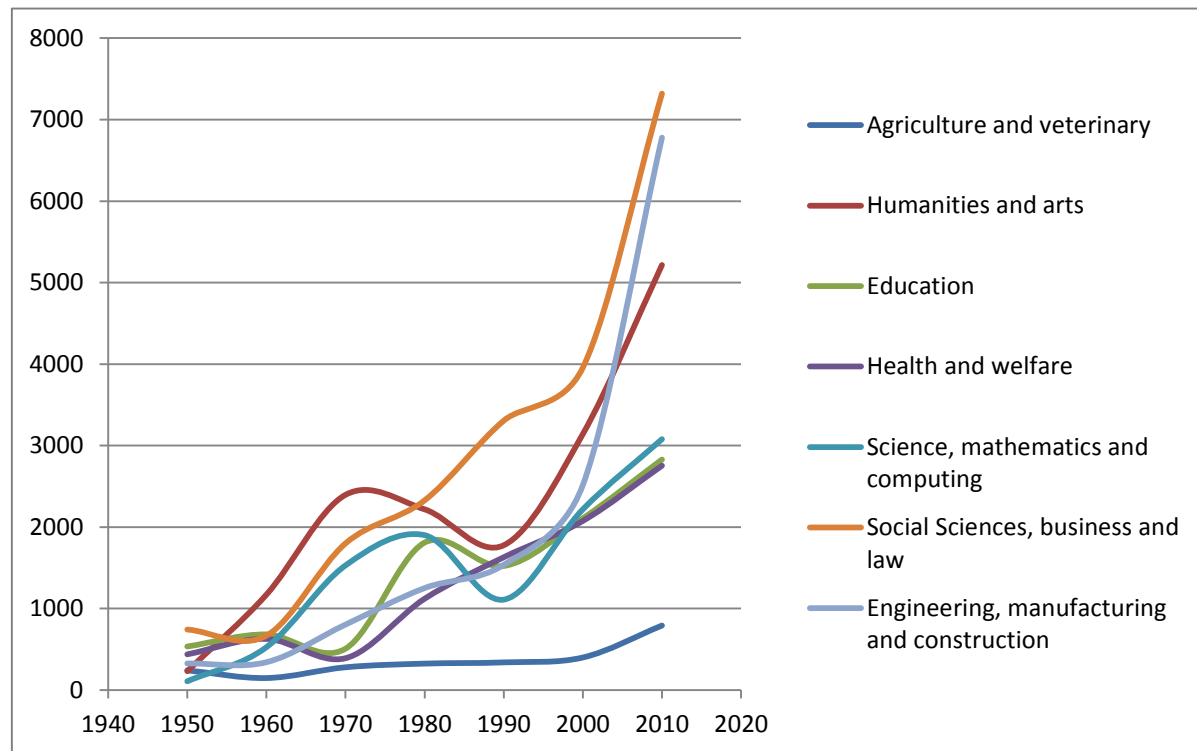
Sources: Statistical yearbook of Finland 1951: tables 301-308, Statistical yearbook of Finland 1960: tables 329-330, Statistical yearbook of Finland 1970: tables 345-347, Statistical yearbook of Finland 1981: tables 328-331 Statistical yearbook of Finland 1992: tables 395-397, Statistical yearbook of Finland 2000: tables 328-332, Statistical yearbook of Finland 2011: tables 381-384.

Figure 3.10: Shares of registered university students by seven broad fields of study from 1950 to 2010.



When measured by number of graduates in 1950, Social sciences, business and law was the largest field of study with its total number of 740 graduates, 28 per cent of all graduates. In 2010 the Social sciences, business and law is still the largest field now with 7,300 graduates, which is 25 per cent of all graduates. The smallest field ever since 1980 has been Agriculture and veterinary science. In the field of Engineering, manufacturing and construction the total number of graduates has almost tripled from 2,500 in 2000 to 6,800 in 2010, which means that it has climbed from fourth to the second largest field.

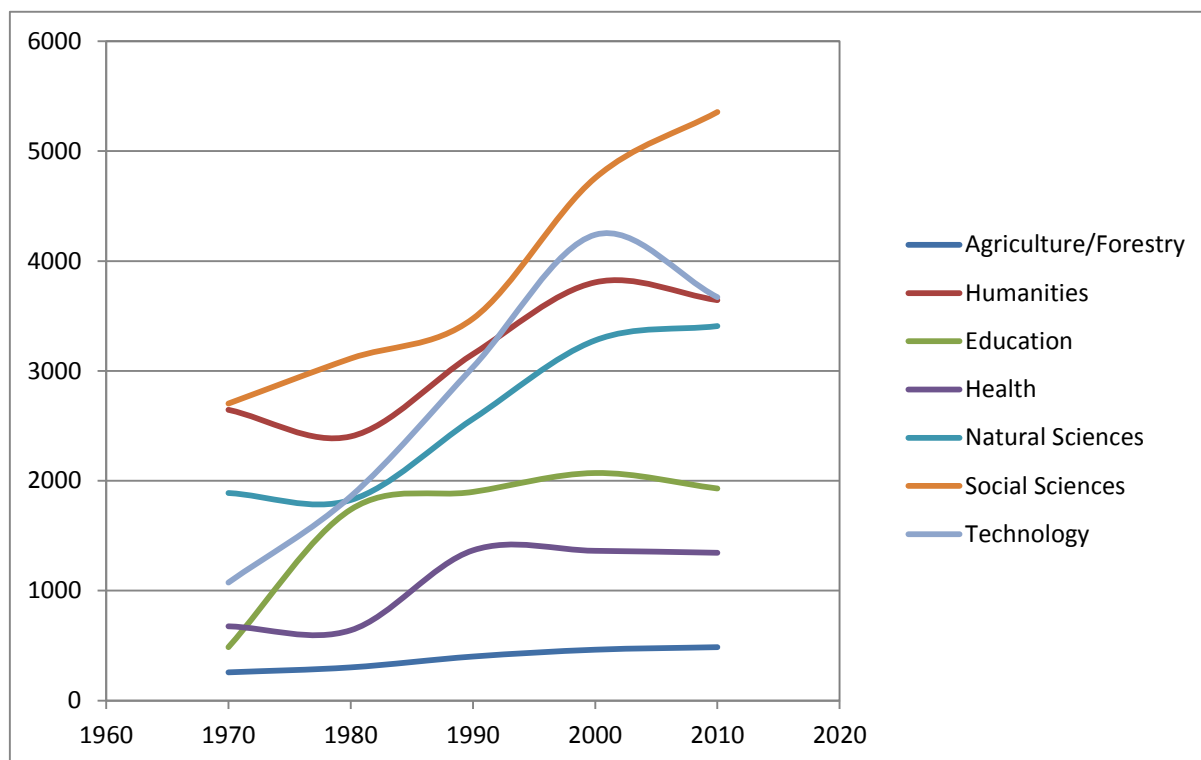
Figure 3.11: Number of university graduates by seven broad fields of study from 1950 to 2010.



Sources: Statistical yearbook of Finland 1951: tables 301-308, Statistical yearbook of Finland 1960: tables 329-330, Statistical yearbook of Finland 1970: tables 345-347, Statistical yearbook of Finland 1981: tables 328-331 Statistical yearbook of Finland 1992: tables 395-397, Statistical yearbook of Finland 2000: tables 328-332, Statistical yearbook of Finland 2011: tables 381-384.

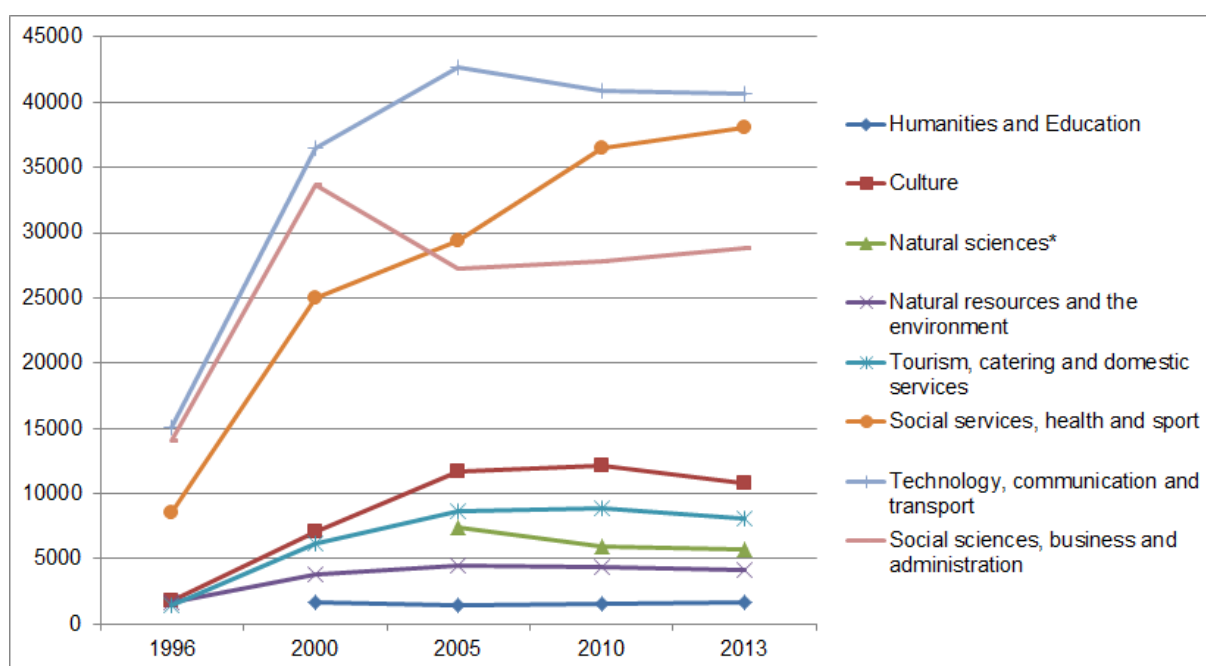
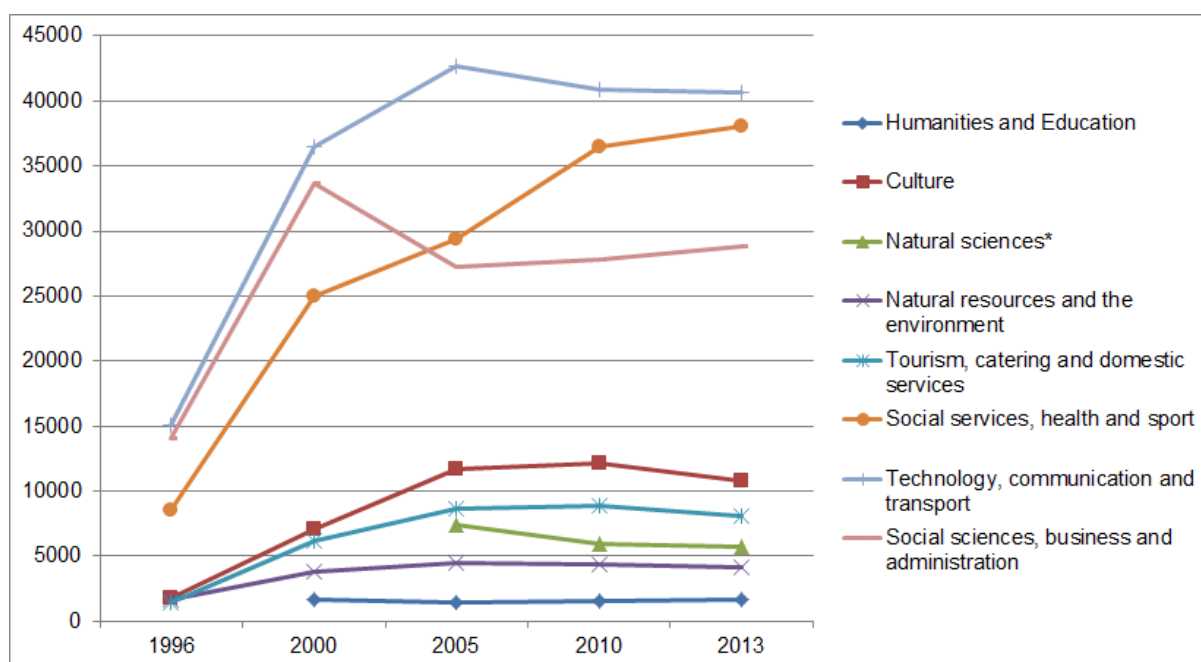
When measured by number of entrants in 1970, Social sciences, business and law was the largest field of study with 2,700 entrants, 28 per cent of all entrants. In 2010 the Social sciences, business and law is clearly the largest field with 5,400 entrants, which is 27 per cent of all entrants. The smallest field ever since 1970 has been Agriculture and veterinary science. In the field of Education the number of entrants more than tripled from 490 in 1970 to 1,700 in 1980 and has remained at that level since.

Figure 3.12: Number of university entrants by seven broad fields of study from 1970 to 2010.



Sources: Statistical yearbook of Finland 1970: tables 345-347, Statistical yearbook of Finland 1981: tables 328-331 Statistical yearbook of Finland 1992: tables 395-397, Statistical yearbook of Finland 2000: tables 328-332, Statistical yearbook of Finland 2011: tables 381-384.

Figure 3.13. Number of registered AMK students by field of study



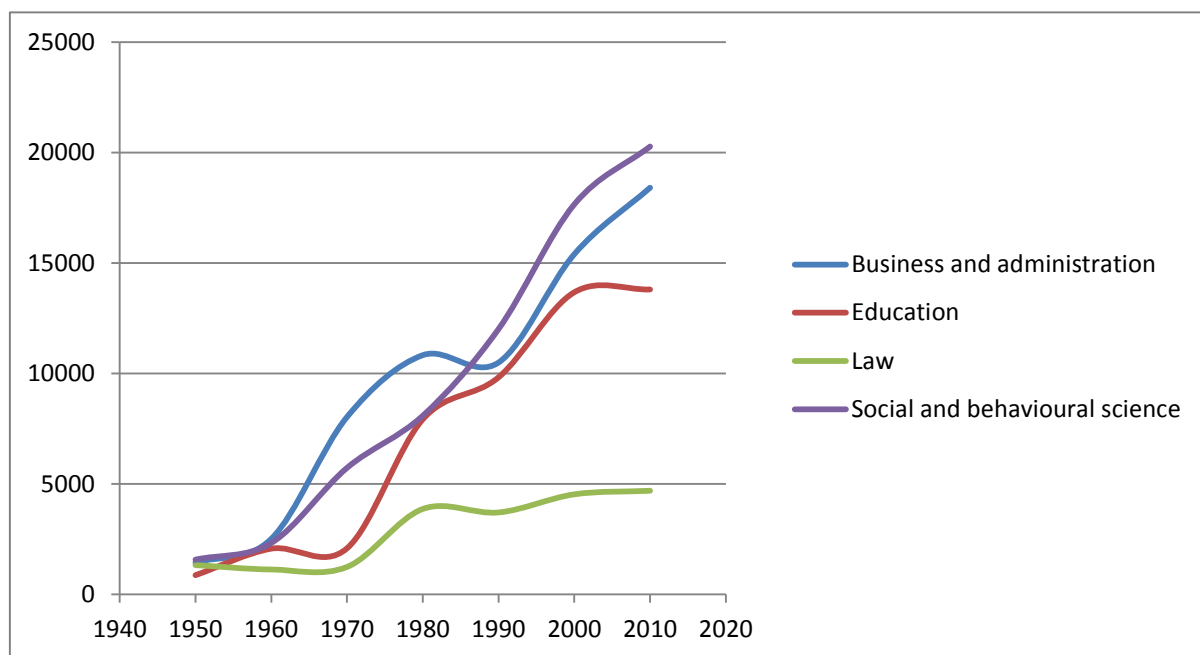
*Natural sciences (mainly data processing programmes) was extracted from social sciences, business and administration – hence the corresponding decrease.

Figure 3.14 shows the development in terms of student numbers in the AMK sector. We can see, first, that there are three big fields which account for 78 per cent of the total volume, namely Technology, communication and transport; Social services, health and sport; and Social sciences, business and administration. Only the Social service and health field has kept growing, in the other fields there is increasing pressure to reduce intake due to apparent over-education. The field of Cultural education has especially been considered problematic during the years of expansion. It is very popular among applicants but labour market outcomes have been among the worst of all fields.

3.5.2 Education, social sciences, business and law

When looking into broad fields in more detail we may first start with Education (ISCED97 code 14), Social and behavioural sciences (31) including also Journalism and information (32) as well as Welfare (76), Business (34) and Law (38). Measured by number of registered students the largest field in 2010 is Social and behavioural sciences with over 20,000 students. Second largest is Business and administration totalling over 18,000 students in 2010. In 1950 in both of these large fields the student numbers were less than one tenth of that in 2010; Business 1,400, Social sciences 1,600. In Law the student numbers tripled from 1,200 in 1970 to 3,900 in 1980 and have stayed around that level ever since. Psychology is the youngest and smallest field with number of entrants rather stable at around 2,000.

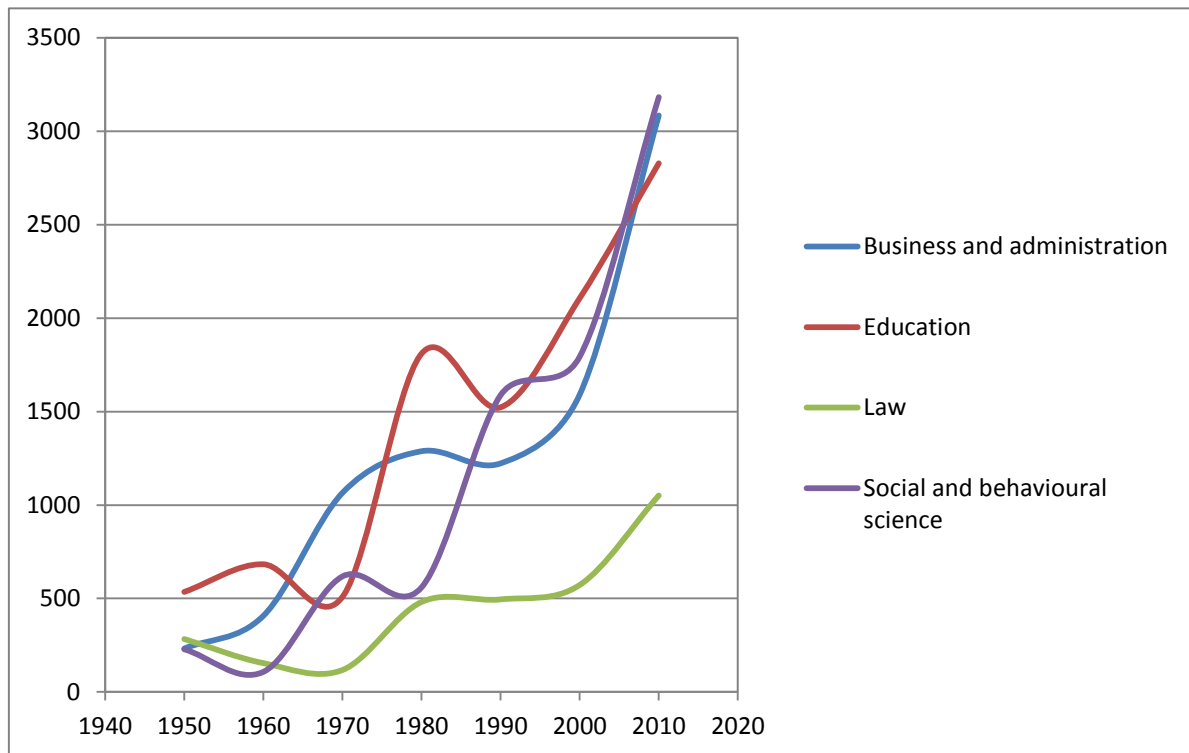
Figure 3.14: Number of registered university students in social and behavioural sciences, business and administration, education and law from 1950 to 2010.



Sources: Statistical yearbook of Finland 1951: tables 301-308, Statistical yearbook of Finland 1960: tables 329-330, Statistical yearbook of Finland 1970: tables 345-347, Statistical yearbook of Finland 1981: tables 328-331 Statistical yearbook of Finland 1992: tables 395-397, Statistical yearbook of Finland 2000: tables 328-332, Statistical yearbook of Finland 2011: tables 381-384.

Measured by total number of graduates the largest field in 1950 was Education, with 540 graduates. In 2010 Business was the largest field with 3,100 graduates. In Education and Social sciences the graduate volumes have grown as swiftly as in Business. However in Law and in Psychology the growth has been more moderate. In Law there are 1,100 and in Psychology 460 graduates in 2010.

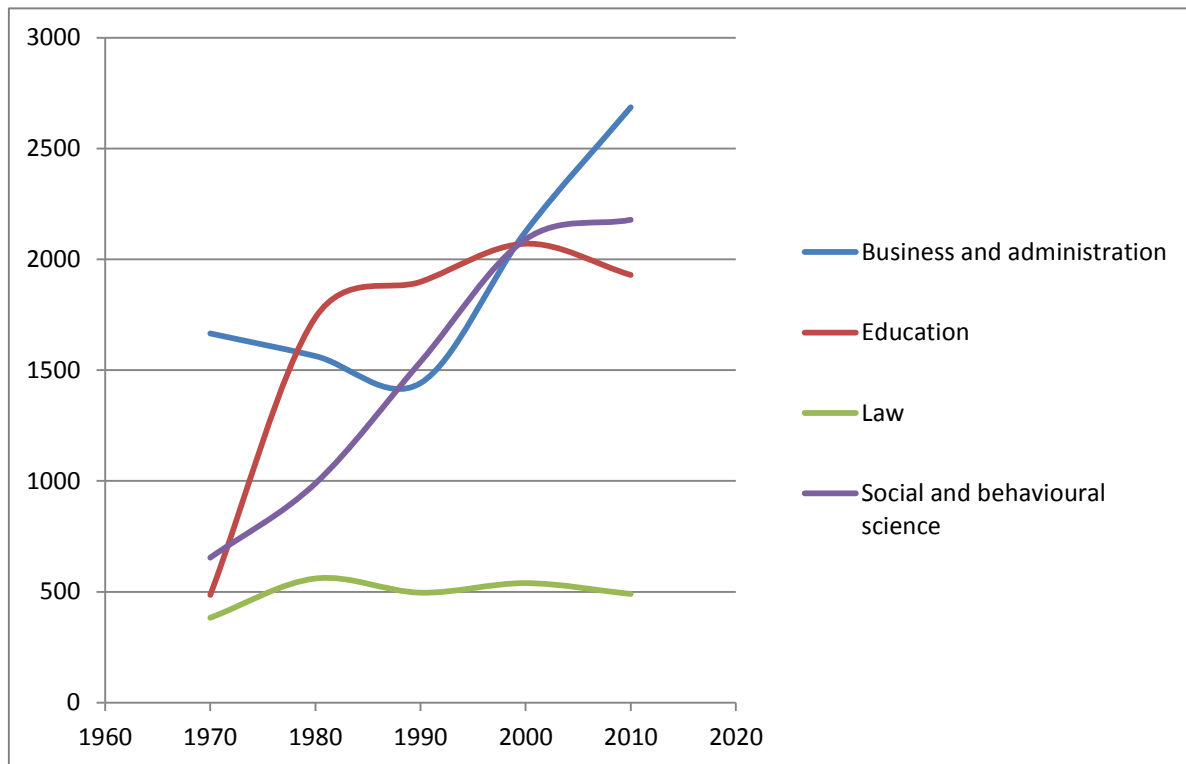
Figure 3.15: Number of graduates in social and behavioural sciences, business and administration, education and law from 1950 to 2010.



Sources: Statistical yearbook of Finland 1951: tables 301-308, Statistical yearbook of Finland 1960: tables 329-330, Statistical yearbook of Finland 1970: tables 345-347, Statistical yearbook of Finland 1981: tables 328-331 Statistical yearbook of Finland 1992: tables 395-397, Statistical yearbook of Finland 2000: tables 328-332, Statistical yearbook of Finland 2011: tables 381-384.

Measured by number of entrants the largest field in 1970 was Business, with 1,700 entrants. In 2010 Business is again the largest field with 2,700 entrants. The number of entrants in Education rose from 490 in 1970 to 1,700 in 1980 and has remained stable at that level since. The number of entrants in Social sciences has followed that of Education but with less rapid changes. In Law and in Psychology the number of entrants has practically remained stable; in Law at a level of 500 entrants and in Psychology at a level of 200 entrants.

Figure 3.16: Number of entrants in social and behavioural sciences, business and administration, law and education from 1970 to 2010.

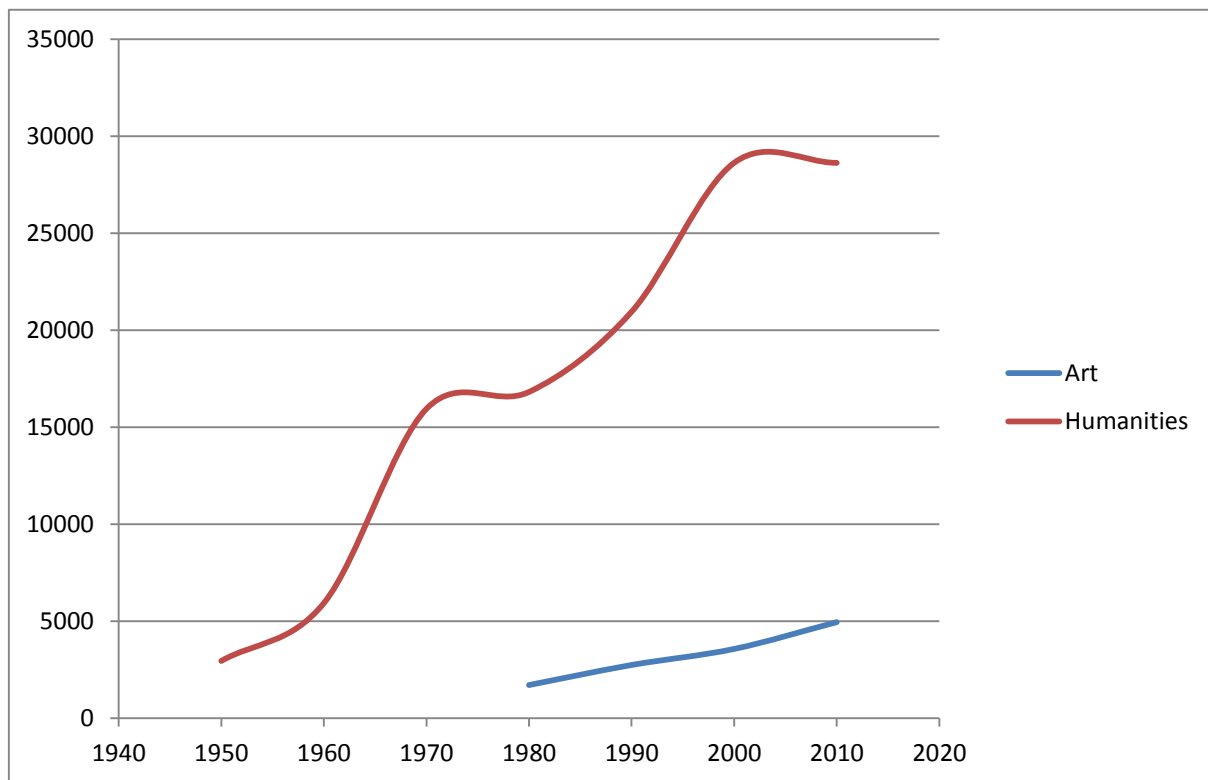


Sources: Statistical yearbook of Finland 1970: tables 345-347, Statistical yearbook of Finland 1981: tables 328-331 Statistical yearbook of Finland 1992: tables 395-397, Statistical yearbook of Finland 2000: tables 328-332, Statistical yearbook of Finland 2011: tables 381-384.

3.5.3 Humanities and Arts

The broad field of humanities and arts can be broken down into humanities (22) and arts (21). Measured by the number of registered students the humanities is clearly larger of the two and has also grown more rapidly than arts. The growth in number of registered students in humanities ceased to rise in the 2000s and stabilised at the level of 30,000 students, while in arts the number of registered students seems to be increasing steadily, meeting the 5,000 student mark in 2010.

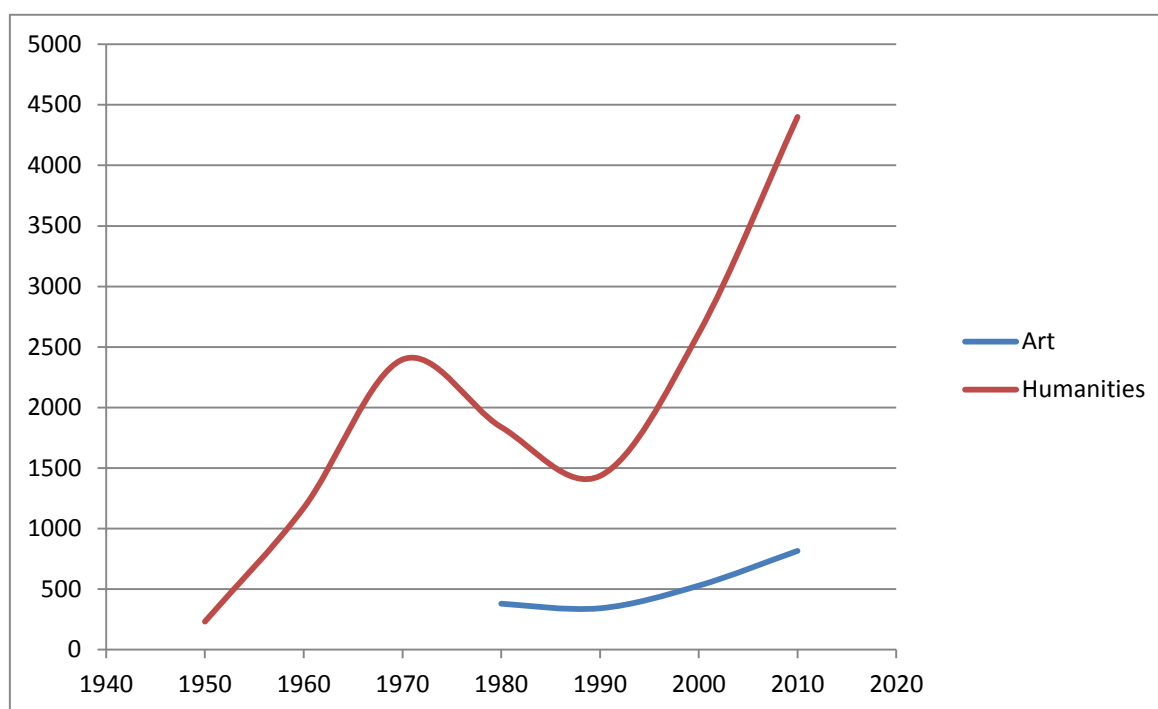
Figure 3.17: Number of registered university students in humanities and arts from 1950 to 2010.



Sources: Statistical yearbook of Finland 1951: tables 301-308, Statistical yearbook of Finland 1960: tables 329-330, Statistical yearbook of Finland 1970: tables 345-347, Statistical yearbook of Finland 1981: tables 328-331 Statistical yearbook of Finland 1992: tables 395-397, Statistical yearbook of Finland 2000: tables 328-332, Statistical yearbook of Finland 2011: tables 381-384.

Measured by number of graduates the humanities is also clearly larger of the two. The number of graduates in humanities has tripled from 1990 to 2010, while in arts the number of registered students has doubled during the respective period.

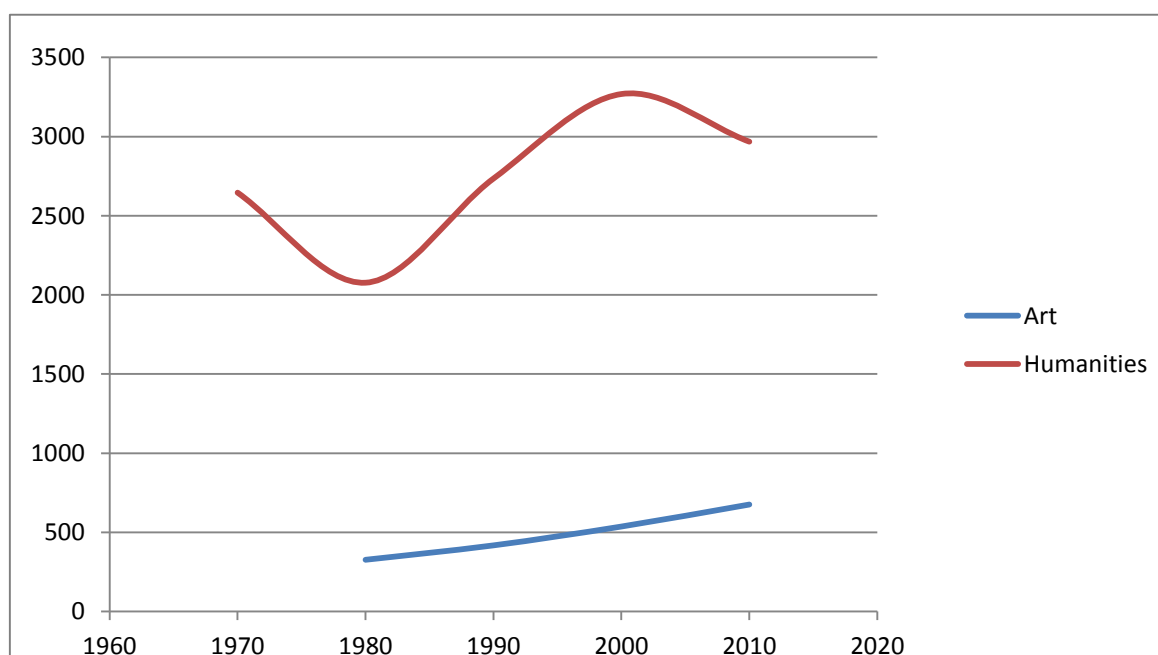
Figure 3.18: Number of university graduates in humanities and arts from 1950 to 2010.



Sources: Statistical yearbook of Finland 1951: tables 301-308, Statistical yearbook of Finland 1960: tables 329-330, Statistical yearbook of Finland 1970: tables 345-347, Statistical yearbook of Finland 1981: tables 328-331 Statistical yearbook of Finland 1992: tables 395-397, Statistical yearbook of Finland 2000: tables 328-332, Statistical yearbook of Finland 2011: tables 381-384.

The number of entrants in the humanities is clearly larger than in the arts. In the early 2000s the number of entrants in humanities seems to have turned into a decrease. In arts the number of entrants grew steadily, reaching 700 in 2010.

Figure 3.19: Number of university entrants in humanities and arts from 1970 to 2010.

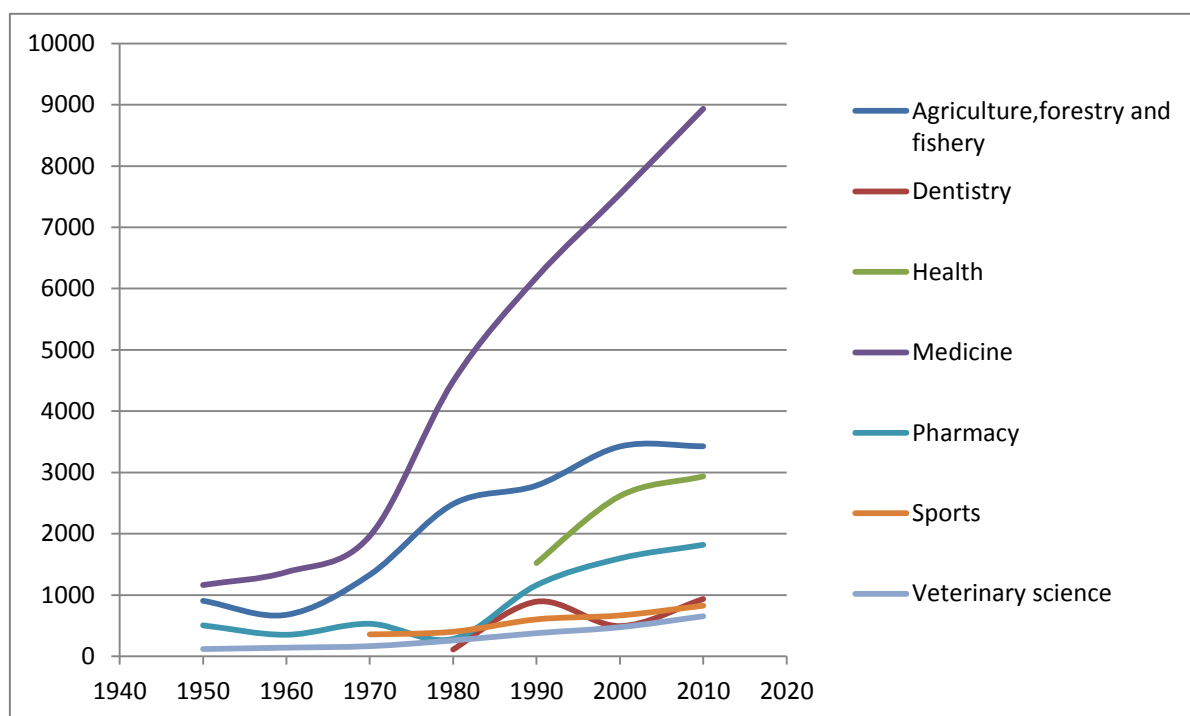


Sources: Statistical yearbook of Finland 1970: tables 345-347, Statistical yearbook of Finland 1981: tables 328-331 Statistical yearbook of Finland 1992: tables 395-397, Statistical yearbook of Finland 2000: tables 328-332, Statistical yearbook of Finland 2011: tables 381-384.

3.5.4 Agriculture, health and welfare

The broad fields of Agriculture as well as Health and welfare can be broken down to Agriculture, forestry and fishery (62), Veterinary science (64) and Health (72). We can further extract Medicine, Dentistry and Sports from Other health sciences. Measured by the number of registered students Medicine shows the most significant growth, approaching 9,000 in 2010. Agriculture, forestry and fishery has also grown clearly from 1950 to 2000 but has recently ceased to rise. Health and Pharmacy have grown especially during 1980s and 1990s. Dentistry, Sports and Veterinary science have remained small fields with fewer than 1,000 registered students.

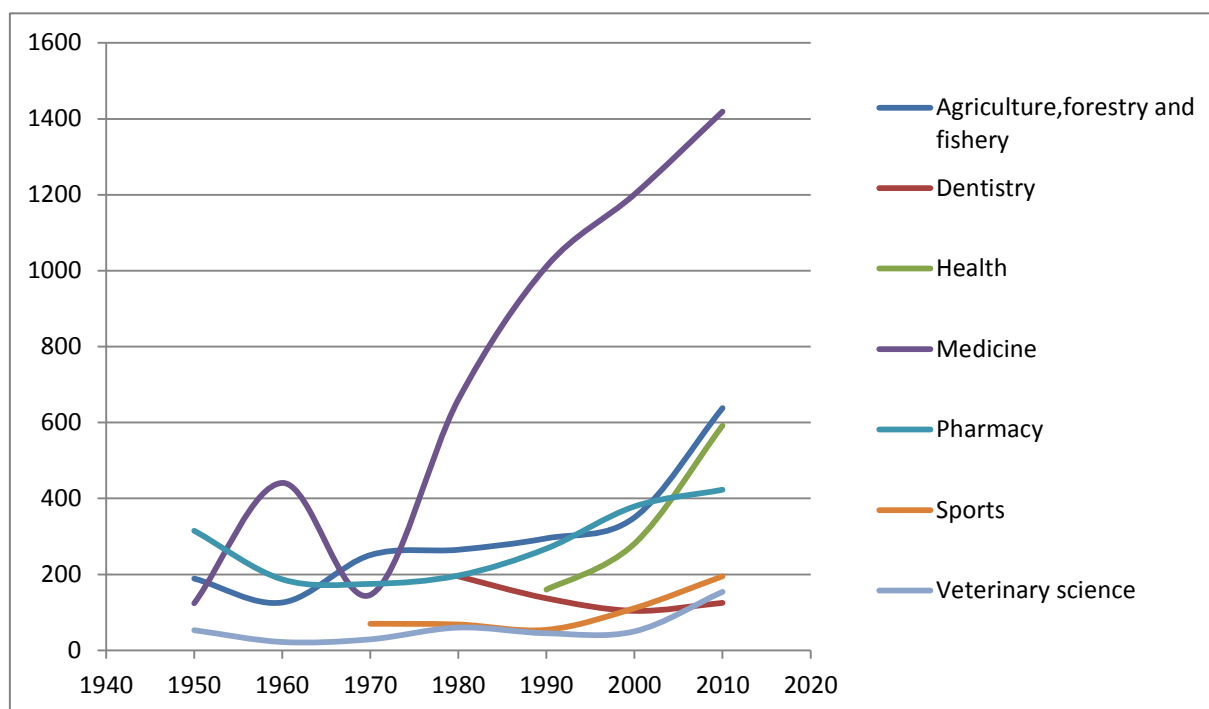
Figure 3.20: Number of registered university students in medicine, agriculture, forestry and fishery, pharmacy, health, sports, dentistry and veterinary science from 1950 to 2010.



Sources: Statistical yearbook of Finland 1951: tables 301-308, Statistical yearbook of Finland 1960: tables 329-330, Statistical yearbook of Finland 1970: tables 345-347, Statistical yearbook of Finland 1981: tables 328-331 Statistical yearbook of Finland 1992: tables 395-397, Statistical yearbook of Finland 2000: tables 328-332, Statistical yearbook of Finland 2011: tables 381-384.

Measured by the number of graduates Medicine also shows the most significant growth. Agriculture, forestry and fishery together with Health show rapid growth in the 2000s. Dentistry, Sports and Veterinary science have remained small fields with fewer than 200 graduates.

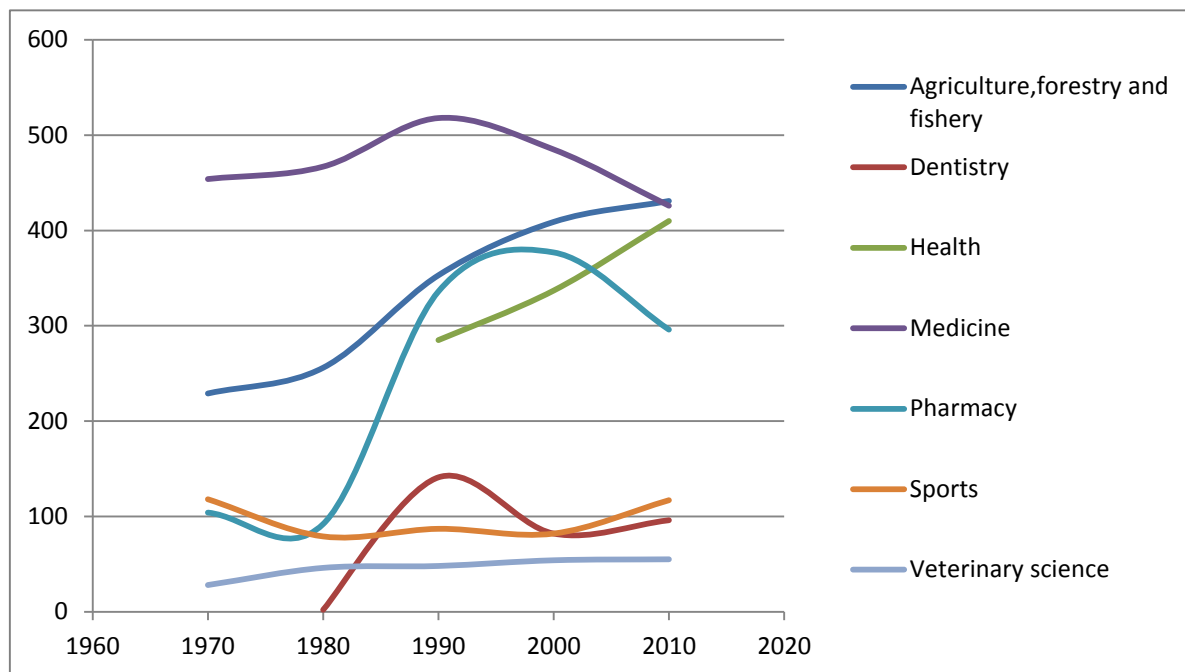
Figure 3.21: Number of university graduates in medicine, agriculture, forestry and fishery, pharmacy, health, sports, dentistry and veterinary science from 1950 to 2010.



Sources: Statistical yearbook of Finland 1951: tables 301-308, Statistical yearbook of Finland 1960: tables 329-330, Statistical yearbook of Finland 1970: tables 345-347, Statistical yearbook of Finland 1981: tables 328-331 Statistical yearbook of Finland 1992: tables 395-397, Statistical yearbook of Finland 2000: tables 328-332, Statistical yearbook of Finland 2011: tables 381-384.

Measured by the number of entrants Medicine has remained the largest until 2010, when Agriculture, forestry and fishery just surpassed Medicine as the largest field. There is a recent decline in the number of entrants not only in Medicine but also in Pharmacy. Consequently Health has become the third largest field in number of entrants just behind Medicine. Sports and Dentistry have remained at the level of about 100 entrants, veterinary science clearly under this level.

Figure 3.22: Number of university entrants in medicine, agriculture, forestry and fishery, pharmacy, health, sports, dentistry and veterinary science from 1970 to 2010.



Sources: Statistical yearbook of Finland 1970: tables 345-347, Statistical yearbook of Finland 1981: tables 328-331 Statistical yearbook of Finland 1992: tables 395-397, Statistical yearbook of Finland 2000: tables 328-332, Statistical yearbook of Finland 2011: tables 381-384.

3.6 Institutional landscape

3.6.1 Expansion and development of the institutional structure

Expansion and development of Finnish higher education can be classified in three broad phases. The first can be characterised as the era of the elite university (-> 1950s), with a prevailing policy doctrine of academic traditionalism (cf. Rinne, Kivinen & Ketonen 1993). The second is the era of massification accompanied with a strong developmental doctrine (-> late 1980s). The third is the era of diversification characterised especially by the founding of the AMKs, and a doctrine of efficiency and accountability. They are shortly described below (for more information see [organisational report]).

The development of the first half of the century, before the “education explosion” of the 1950s and 1960s, can be characterised as the forming of a loosely integrated higher education system. The development and expansion was largely uncontrolled, driven by increasing social demand and economic development. The core of the system was the University of Helsinki, dating back to the Academy of Turku founded in 1640. It was, in a way, the “accrediting agency” in the university field, relying on its traditional autonomy. The Helsinki University of Technology (1908/1849) functioned in its own special field, operating directly under the Ministry of Trade and Industry. During this phase the Finnish system developed two distinct sectors. On one hand, there were the Humboldtian universities and, on the other, there were various specialised higher education institutions some of which later became full universities. (Ahola 1995.)

At the beginning of the 1950s the Finnish higher education system comprised eleven institutions. Most of the institutions were in the capital area and only one was outside the main southern area of Finland. The University of Helsinki was still the leading university in Finland. In terms of student numbers, it accounted for two thirds of the total enrolment which were 15,000 in 1950 (see figure 3.13).

The development during the second phase, from the 1950s to the late 1980s can be characterised as the forming of a tightly integrated, State controlled mass higher education system. During this period a distinct higher education policy was initiated, several new institutions were established, private institutions were nationalised and the whole higher education system was squeezed into a new kind of planning and control system.

The expansion was reinforced and legitimated by passing a special Development Act of Higher Education in 1966 (SA 228/66). With this law the state committed to expanding higher education. The law enabled a new kind of state controlled and bureaucratic planning system which was based on new ideas of efficiency. This system did not, however, meet well with the everyday social, political and educational problems of university life. Also the old academic administration of the universities was unable to adjust to the new needs of the mass university. Consequently, the massification led also to a massive degree reform and a new system of institutional administration (Kivinen, Rinne & Ketonen 1993).

In spite of the fact that the main forces for expansion came from the expanding economy and from the needs of the labour market, and that the new institutions were established primarily to produce a highly qualified workforce, local interests and the State policy favoured university-like institutions. In addition, regional policies played an important role in the expansion process. It was also an established national policy, relating to the overall policy of equality of educational opportunity, that the number of study places should correspond with the young age cohorts in the regions. Local political struggles added a flavour to this overall policy. Thus, during the transition period, Finland developed an additional sector: small, characteristically local higher education institutions which offered university-level degrees but lacked the multi-faculty nature of the older universities (Ahola 1995.)

During the transition period (from 1950 to 1970) the number of university students increased from 15,000 to 60,000. Martin Trow (1972; 1999), who coined the term massification, set the critical point of expansion at 15 per cent, meaning that, as roughly 15 per cent of the age grade enters the system, it is forced to change internally. In the Finnish case university enrolment was about five per cent of the relevant age group in the beginning of the 1950s. Since then the expansion forced considerable transformation of the system. The threshold set by Trow was reached not until the beginning of the 1970s (see figure 3.1). This does not undermine Trow's model but just underlines the really elite nature of the elite university era.

In the third phase of diversification the decisive feature was the founding of the AMKs. The idea was to reorganise the transition to higher education by creating a new basis for higher learning, and to develop part of upper secondary vocational education to the level of higher education. (Ahola, Kivinen & Rinne 1992). This was considered necessary not only from the point of view of the quality and attraction of vocational training but also from the point of view of the overcrowded mass universities. There was a strong conviction that the new institutions (AMKs) would resolve the matriculation backlog problem⁴. In Finland the reform had to do also with international comparability: some vocational qualifications classified in tertiary education elsewhere were upper secondary in the Finnish system. The AMK model was close to the German *fachhochschule* (*ammattikorkeakoulu* in Finnish).

Political acceptance for the reform was sought by choosing an experimental strategy. The interests of local vocational institutions, actors and stakeholders were also important. In 1991 the Government granted permission for 22 temporary polytechnics. They were both multi- and mono-field conglomerates comprising 85 vocational schools, 18 per cent of all vocational institutions at that time (Lampinen & Savola 1995). The law on the experiment was in effect until the end of 1999, and the idea was to closely monitor and evaluate the experiment, after which final decisions were expected. The system was regularised, however, already by 1995.

⁴ The growing pool of applicants due to the discrepancy between the number of applicants and the number of places in higher education.

The following table shows the number of AMKs through the experimental and regularisation phases. At the end, in 2000, the number of permanent AMKs was 29⁵, and the total number of students was 114,000. For comparison, the number of university students was 158,000.

Table 3.1: Temporary and permanent AMKs from 1992 to 2000.

Year	Temporary AMKs	Permanent AMKs	ALL
1992	22	0	22
1995	22	0	22
1996	19	9	28
1997	14	16	30
1998	12	20	32
1999	7	24	31
2000	0	29	29

Source: MinEdu 2001

In our analysis the special nature of the AMKs, related to the strong dual policy maintained by the Ministry and Government (cf. Ahola 1997), affecting also available statistics and classifications, means that they are mostly treated separately from the universities.

3.6.2 Institutional development

In order to understand the current structure, the “big” university reform (new University Law in 2009) has to be mentioned. The reform made a profound change in the university-state relationship. Universities were separated from the state, and currently they are either independent legal entities under public law or foundations under private law. Administrative changes increasing managerialism and the role of outsiders in university governance result from a longer, gradual development. The reform included also important mergers of which the Aalto University, combining the former Helsinki University of Technology, the Helsinki School of Economics and Business Administration, and the College of Arts and Design, is a special case (e.g. Kivistö & Tirronen 2012). The latest merger combined the remaining three art colleges (Sibelius Academy, Theatre Academy, Academy of Fine Arts) into the University of Arts Helsinki.

Also the AMK sector has experienced a few mergers, and currently there are 25 institutions. The overall institutional development from 1950 to 2013 is illustrated in table 3.2. Aalto University is recorded in the university group, although it is not a multi-faculty institution in the same sense as the other universities.

Table 3.2: Number of different types of higher education institutions 1950-2000.

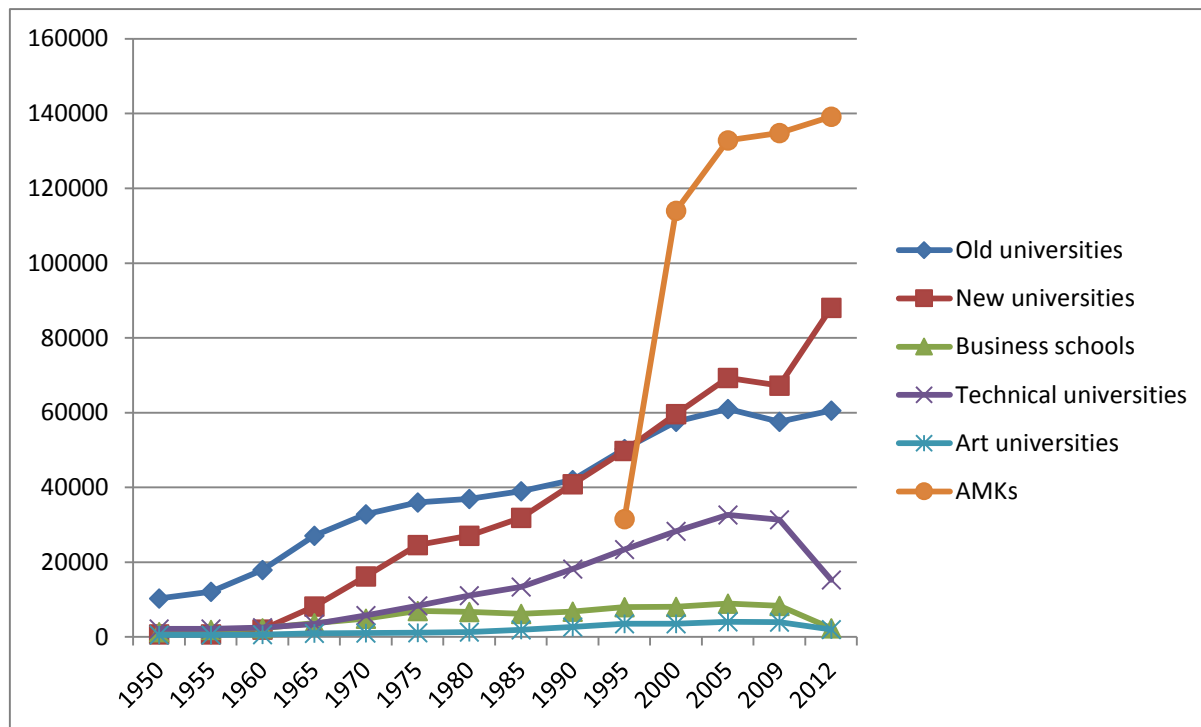
Type of institution	1950	1960	1970	1980	1990	2000	2013
Universities	3	4	7	10	10	10	10
Technical universities	1	1	3	3	3	3	2
Business schools	4	4	5	3	3	3	1
Art academies	2	2	2	3	3	4	1
Other / AMKs	3	3	2	2	0	29	25

Figure 3.23 shows the total number of students by the type of institution. Universities have been divided into two groups, the old universities (Helsinki, Turku and Åbo Akademi) and the new regional ones. In terms of student numbers the latter group surpassed the old ones during 2000s. In 1950 the old universities accounted for nearly 70 per cent of the overall enrolment. In 1990, before the AMKs, their share was 38 per cent. In 2009, before the big university reform, and the mergers, the share of new

⁵ The Police Academy and the Åland's AMK, which was still on temporary bases are excluded from the figures

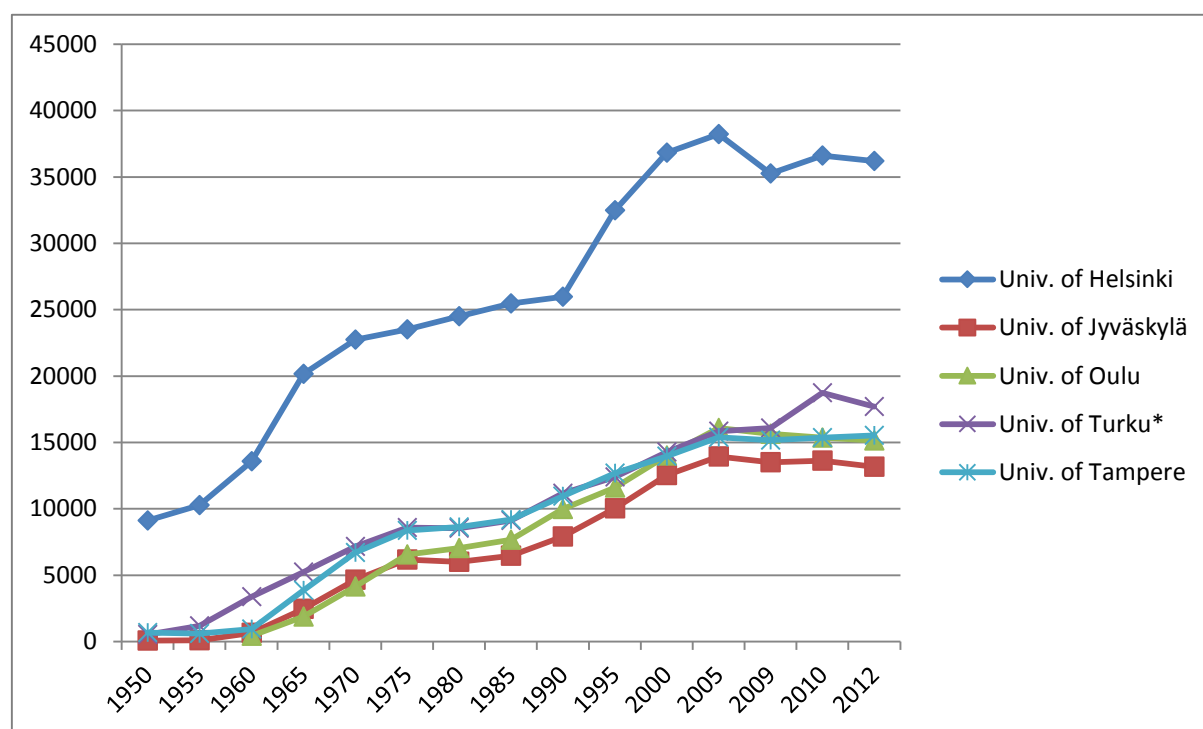
universities had grown to 53 per cent. One typical feature of Finnish higher education policy has been strong investment in technical education. The share of technical universities rose to almost 20 per cent in 2009. In addition there has also been a technical faculty in the University of Oulu and Åbo Akademi. If we look students by field of study, technical education accounted for 21 per cent.

Figure 3.23: Total number of students by type of institution in 1950-2012.



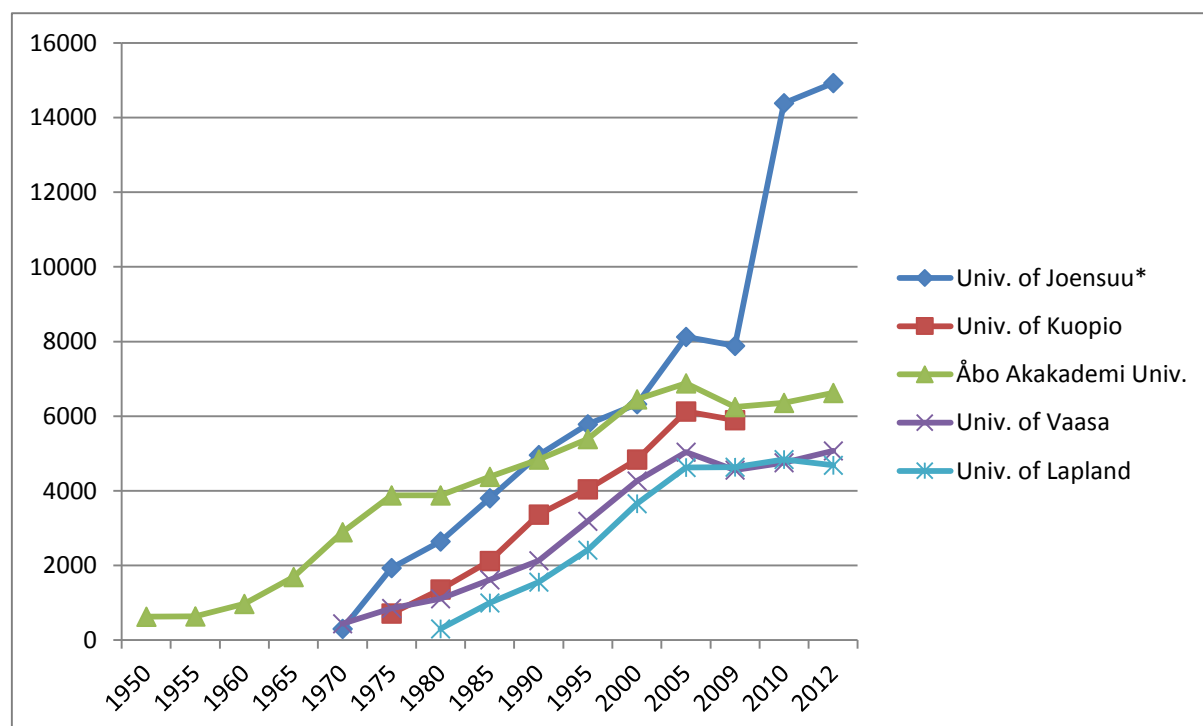
Figures 3.24 - 3.27 show the detailed development of the university sector. Figure 3.24 shows that the University of Helsinki is clearly in its own league, with student numbers above 35,000. The middle league comprises four institutions, student numbers being about 15,000. Today, the University of Eastern Finland belongs to this group too (figure 3.25). The rest of the multifaculty institutions are relatively small, student numbers ranging from 4,600 to 6,600. Figures 3.26 and 3.27 show the total student numbers in the specialised institutions. Figure 3.26 includes the three institutions which merged into Aalto University. Of them the Helsinki University of Technology was a large institution, and compares to the middle university league. After the merger, Aalto University, with almost 20,000 students, is the second largest.

Figure 3.24: Total students by universities – part 1



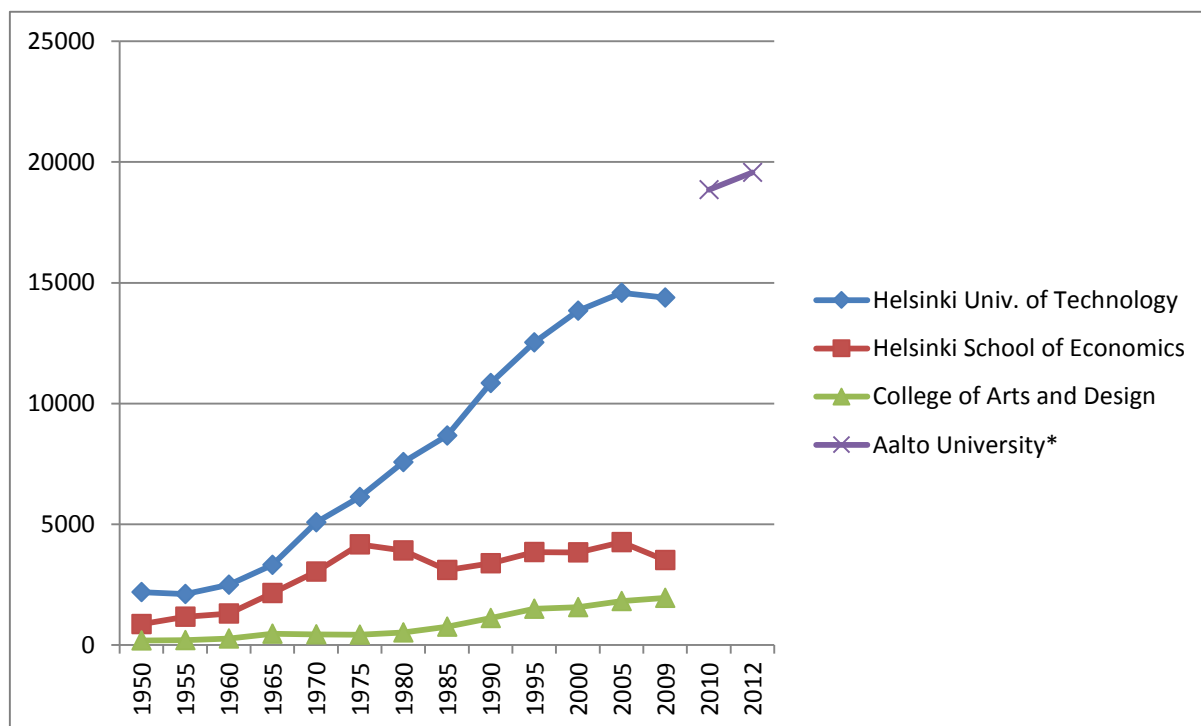
*Merger with Turku Business School in 2010

Figure 3.25: Total students by universities – part 2



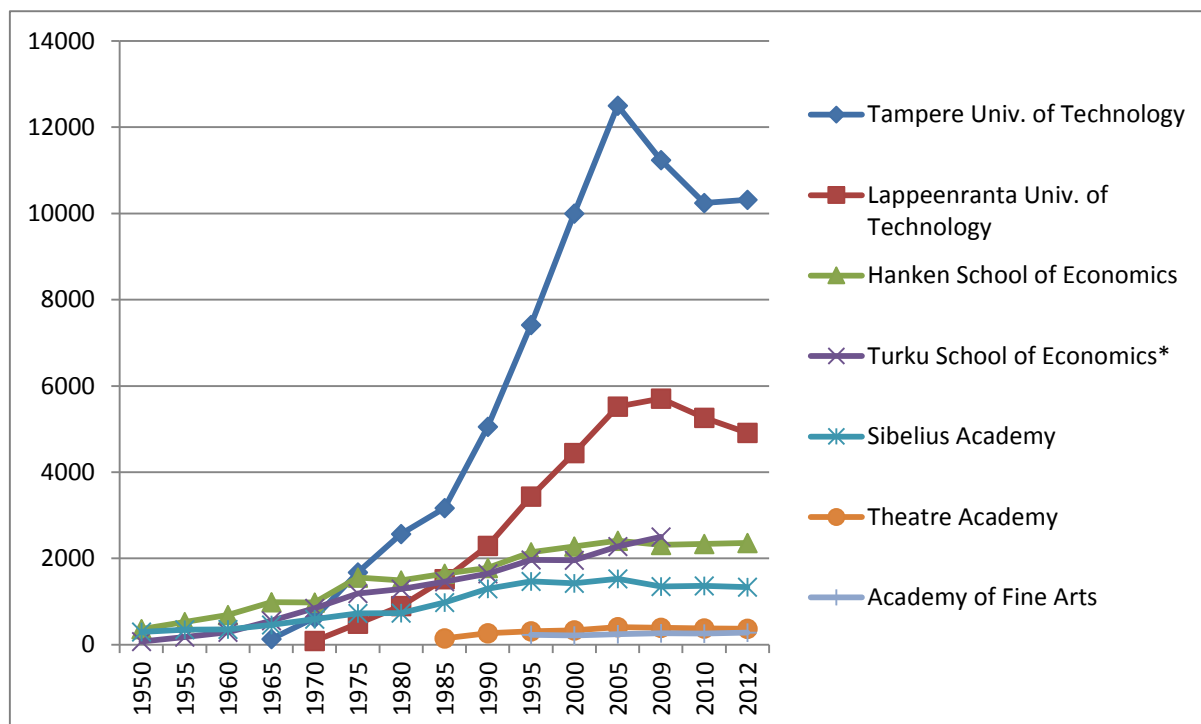
*University of Eastern Finland after merging with University of Kuopio in 2010

Figure 3.26: Total students by institution – specialised institutions part 1



*After merging of three institutions in 2010

Figure 3.27: Total students by institution – specialised institutions part 2



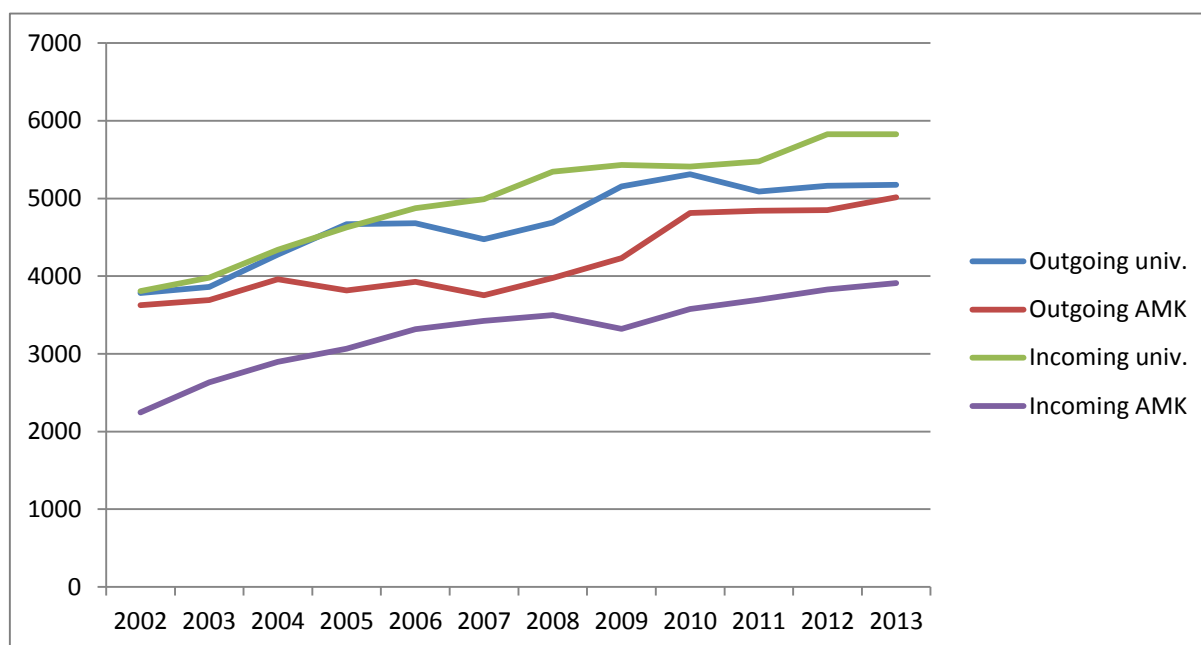
*Merged with the University of Turku in 2010 (see figure 3.24 above)

3.7 Internationalisation

In Finland internationalisation emerged on the higher education policy agenda in the late 1980s in connection with the integration of the European Union and its specific mobility programmes. In 1991 the Centre of International Mobility (CIMO) was founded under the Ministry of Education. Its task was to co-ordinate student and teacher mobility, and actively promote Finland as an “education society.” The problem of Finland at that time was that not so many foreign students wanted to come to Finland, and the number of outgoing exchange students was low.

In 2009 the Finnish Ministry of Education and Culture drafted a special strategy paper on internationalisation as a response to increasing globalisation of higher education and the new challenges posed by the Bologna process. According to the strategy, the overall quality of Finnish higher education has improved, and international networking has increased but, as compared with many other European countries, the level of internationalisation is still low. Students’ interest in studying abroad has not increased as hoped for (MinEdu 2009).

Figure 3:28: Student exchange mobility (minimum of 3 months) in 2002–2013.



Source: CIMO⁶.

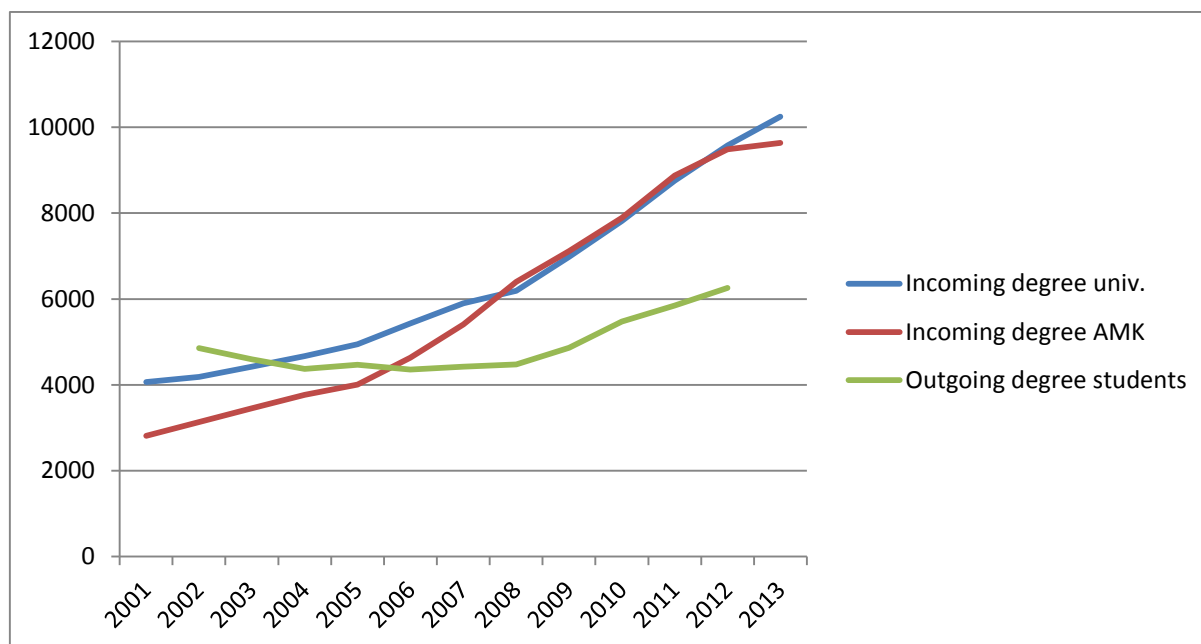
The current situation in Finland, regarding the development of outgoing and incoming mobility over the last decade, is shown in figure 3.28. The overall trend is growing. In the university sector, for instance, allowing for occasional fluctuation, there has been an increase from 3,800 mobile students in 2002 to little over 5,000 in 2013. In the Ministry’s new strategy the target for 2015 was set at 8,000 outgoing university students. Taking especially into account the latest levelling of the growth, it is evident that the target is already out of reach. The proposed measures pertinent to outward mobility included a lucrative temporal funding programme for 2010–2015 stipulating €5m per year. In addition the strategy proposed that all degree programmes include a special internationalisation module supporting mobility, and that higher education institutions streamline their credit recognition procedures. Regarding the additional funding, there is no record that any of it ever materialised, highlighting the overall funding crisis of higher education.

In the AMK sector outgoing mobility was relatively stable until 2007, after which there was rapid increase to 4,800 mobile students in 2010. After that growth slowed down, and the number of outgoing

⁶ http://www.cimo.fi/nakokulmia/tietoa_ja_tilastoja/opiskelijoiden_ja_oppilaitosten_kv-liikkuvuus/opiskelijoiden_liikkuvuus.

AMK students was 5,000 in 2013. In the university sector one problem during the previous years was the imbalance between outgoing and incoming mobility. The balance was struck in 2002, and since 2005 there have been more incoming foreign students than outgoing native ones. At the AMKs the situation is reversed, and it seems that for foreign students the vocational higher education sector is not as lucrative as the universities.

Figure 3.29: Degree student mobility in 2001-2013.



Source: CIMO⁴.

As regards degree student mobility there has been rapid increase in both sectors. In the universities the number of foreign degree students rose from 4,000 in 2001 to little over 10,000 in 2013. At the AMKs growth has been even larger, from 2,800 to 9,600. The figures for Finnish degree students abroad come from the register of the Social Insurance Institution of Finland (KELA), and describe the number of students who have received KELA's student aid for degree leading studies. From 2002 the numbers at first decreased but since 2008 they have risen from 4,500 to 6,200 in 2013.

On overall it is evident that increasing internationalisation is regarded highly important for Finnish higher education. The 2009 working group points especially out to the fact that Finland's own resources are limited and that most new knowledge is produced abroad. Participating in the scientific and technological development and the related decision making in the EU and OECD is considered vital for Finland's economic and cultural interests. There is also a strong conviction that internationalisation enhances quality and that it is a prerequisite for the solving of global problems (MinEdu 2009, 15-17).

3.8 Conclusions

The expansion of Finnish higher education has been continuous except for a few periods of halt and stagnation. The first fast expansion took place during the 1950s and the first part of the 1960s. From 1950 to 1965 the number of university entrants grew 3.5 times. From 1965 to 1990, including some fluctuations, the number of entrants grew 1.5 times. The system expanded due to increased overall demand and the founding of new institutions around the country. Needs for a highly educated workforce, regional policies, and the policy of equal opportunity were decisive factors of expansion.

From the 2000s onwards, the university sector has not grown. The needs for growth were directed to short-cycle, vocationally oriented higher education by establishing the AMKs. Thus, when the university

sector grew 6.4 times from 1950 to 2000, including the AMKs, the growth was 15-fold. In terms of the number of institutions, a system of 13 higher education institutions in 1950 had evolved to a dual system with 20 university level institutions and 29 AMKs. After that rationalisation and mergers have been inevitable. Currently there are 25 AMKs with annual intake of 26,900 students and 14 universities with some 20,000 new students annually.

One feature of expansion is that it is directed to the new types of institutions, most notable the AMKs in Finland. Notwithstanding, also the old university institutions have been growing throughout the period. In Finland, the number of students in the new universities did not overtake the numbers in the old universities until the mid-1990s. Of the specialised institutions, the technical universities in particular have grown relatively fast, and the share of students studying engineering and other technical fields is relatively high in Finland. Another feature of the expansion is the increasing share of women in higher education. Women's share of new entrants had already surpassed males at the beginning of the 1970s. Currently the shares are 56/44 f/m.

In Finland bachelor-level degrees were reintroduced in the beginning of the 1990s, and after the Bologna-related degree reform they have consolidated their position in most study fields. However, they suffer from low employability, and are more like intermediate degrees, as in the old system, than self-standing degrees in their own right. In practice in Finland, the master's degree is the first university degree. The AMK degrees are bachelor's level equivalents, and nowadays, due to the Bologna process, the AMKs also have their own master's-level second cycle degree. Their number has grown fast since the introduction in 2005, but their share is less than 10 per cent of the AMK degrees.

The analysis of development of student volumes by fields reveals that social science, business and law has become the largest field followed by humanities and arts. Engineering, manufacturing and construction is about the same size as humanities and arts, although the IT boom and crash of the 1990s and 2000s show particularly in the numbers of entering "technology" students. The increase in the number of students in natural sciences has been clearly more moderate than in technology. The fields of health and welfare and education, both closely related to public sector employment opportunities, have grown steadily but clearly more moderately than the aforementioned four largest fields. More detailed specifications show that in certain fields like law and medicine the number of entering students in particular have remained rather stable throughout the era of expansion.

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4 Norway

Tanja Askvik & Håvard Helland

4.1 Introduction

This chapter examines the development of the number of students in Norwegian higher education mainly in the period from 1975 to 2009. In most of the analyses, we analyse individual level data from Norwegian public registers. On educational activity, such data exist from 1975. However, aggregate level data exist for the entire history of Norwegian higher education. This history is relatively short compared to other European countries; the first Norwegian university (in Oslo) opened in 1813. We will therefore start by presenting some aggregate level statistics, and give a brief review of previous studies, which to some extent also cover the period before 1975. We present how the total volume of the system has changed, before we look more closely at the development from 1975 to 2009 of different parts of the system (different levels, fields and types of institutions). The general trend is one of great expansion. The number of students has increased almost infinitely, and the growth in the number of institutions involved in tertiary education has been manifold. In 2003, Norwegian Higher Education underwent the so-called quality reform, which implemented a degree structure, grading system and quality assurance system in line with the Bologna Process. As of 2003, the degree structure (with some exceptions⁷) consists of a three-year bachelor's degree, a two-year master's and three-year doctorate (PhD).

4.2 The policy context

“Education for all” has been a central aim of Norwegian educational policy for a long time. It may be traced back to the General Education Act of 1793 and through the reforms of the nineteenth century (Opheim 2004), but it really gathered momentum in the 1950s and 1960s. Secondary schools were spread out over the entire country, and geographical accessibility in higher education has been a central political goal since the expansion of the sector in the 1960s and 1970s.

Until 1946, when the University in Bergen was established, The University of Oslo was the only university in Norway. Norwegian higher education had until then expanded through the establishment

⁷ Exceptions are the old university college two year degree (college candidate), five year consecutive master's degrees, six year professional programmes, master's degrees of one to one and a half year's duration, four year bachelor's degrees in performing music and performing arts and four year programmes in teacher education. (<http://www.regjeringen.no/en/dep/kd/Selected-topics/higher-education/Degree-structure-and-grading-system.html?id=491287>).

of several scientific colleges (i.e. more narrowly specialised institutions at university level).⁸ During the 1970s the system of higher education also expanded through the number of institutions. Existing institutions educating teachers, nurses, engineers etc. were upgraded and given status as institutions of higher education from 1970 (Aamodt 1995), and new institutions (regional colleges) were established (Aamodt and Stølen 2003: 71). Important were the reforms of higher education proposed by the “Ottosen-committee”, in three reports to the Government from 1966 to 1968 (KUD 1969). These reports made the ground for a new kind of higher education institution – district colleges, which were located throughout the country. A central purpose of the district colleges was to relieve the traditional universities, which experienced an inflow of a new education-oriented generation. Other purposes of the district colleges were to offer young people in all parts of the country better opportunities to enrol in higher education, and to educate a more qualified work force for the same regions. In the mid-nineties, the specialised institutions educating teachers, nurses, engineers etc. were merged with each other and in most counties with the district colleges, forming the public university colleges. From a situation where higher education in Norway included two universities and a few scientific colleges, we now have colleges in every county (Aamodt and Stølen 2003:86). In 2003, 47 per cent of the students in tertiary education were enrolled in a public university college (Opheim 2004: 31).

At the turn of the century, Norwegian higher education mainly consisted of three different types of institutions: universities, specialised universities (“vitenskapelige høyskoler”) and university colleges (“høyskoler”).⁹ The old universities and specialised universities offer both studies in the various university discipline and prestigious degrees qualifying for elite professions (such as law, graduate engineering, medicine, dentistry, pharmacy and MBA). Whereas the state university colleges primarily offer degrees at bachelor’s level in welfare (such as social work and nursing), education (pre-school and primary school teachers), business administration and technical fields (different types of engineering).

4.3 Expansion of the system

4.3.1 *Expansion in absolute numbers of students, entrants and degrees*

The Norwegian system of higher education has gone through the same enormous growth since the end of World War II as other industrialised countries. The growth started somewhat later in Norway than in many comparable countries, and did not set in before the late 1950s. From 1960 the system experienced a rapid growth, and the number of students grew from 10,000 in 1960 to 40,000 in 1975. (Aamodt 1995: 64). Since then the growth has continued (Vabø and Aamodt 2005: 23).

The growth of the system in the 1960s was in the university sector. During the 1970s, the system of higher education also expanded through the number of institutions. From the 1970s, the growth was bigger in non-university institutions, and from 1975 most of the growth until 1987 came in this part of the sector. Then, towards the end of the 1980s there was again a considerable growth in the university sector and during the early 1990s there was a considerable growth in both types of institutions.

There are many reasons for this development. One type of explanation is functional and stresses the development and diffusion of more advanced technology which requires a better educated workforce. Other explanations focus on competition in the labour market and the increasing necessity for completion of a higher education degree, that more wealth in society increases the demand for higher education or that political prioritising of higher education plays a vital role (Aamodt and Stølen 2003: 71). Most of the expansion in student numbers can e.g. be ascribed to an expansion of the available educational offers both gradually and through reforms (Brandt, Aamodt and Støren 2005: 13). The business cycle also affects the demand for higher education. The steep growth in higher education that we can see from about 1988 is partially explained by the ending of the so-called “yuppie” period,

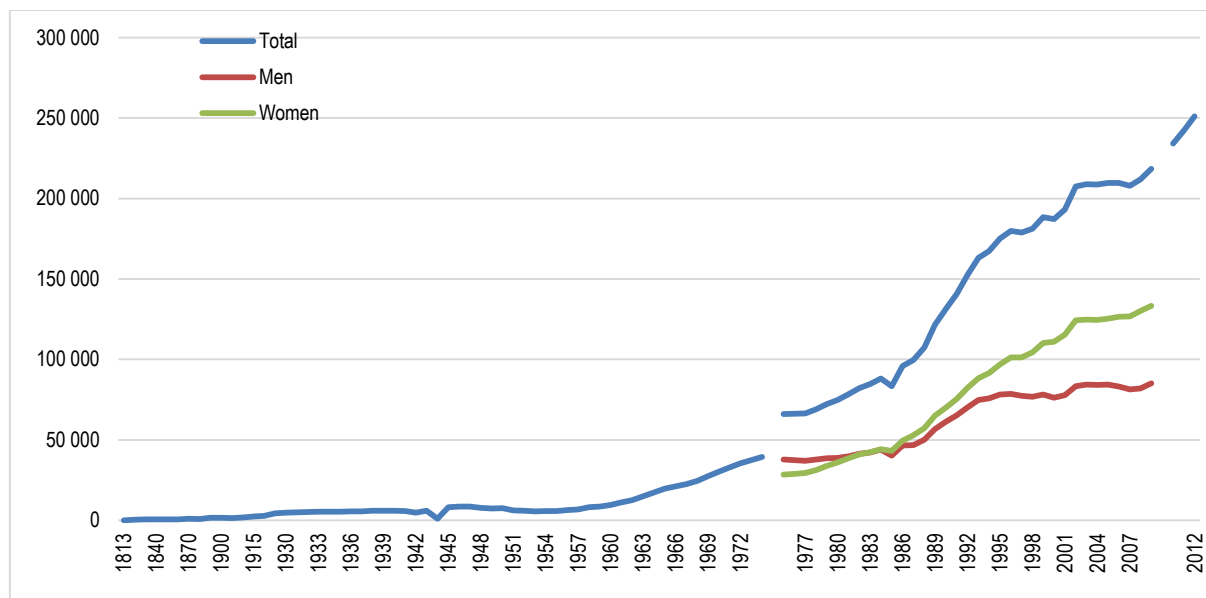
⁸ Specialised universities were established in agriculture in 1859, dentistry in 1905, theology in 1907, technology/engineering in 1910, veterinary medicine in 1935, and business administration in 1936.

⁹ During the last decade, some former university colleges and a specialised university have become universities.

and the following economic recession. The unemployment rates were quite high as a result of this, and the entries to higher education grew in number. This was quite unexpected at the time, and contrary to the predictions based on a quite considerable fall in the size of the cohorts of twenty year-olds (Aamodt and Stølen 2003:72).

Below we show the expansion of the system by three different measures of the student size of the system. First, we present the development through the number of registered students in each year. Then we illustrate the same development by presenting the number of entrants to the system (the first time a student is registered at a higher level of the educational system. Third, we illustrate the expansion by presenting the number of graduates, or degree holders. According to Aamodt (1995: 66) there are “two very distinct features in the expansion of higher education in Norway: a rapidly growing number of female students and mature students”. The share of students older than 30 years of age increased from 10 per cent in 1974 to 23 per cent in 1992. Women have numerically caught up with, and passed, men in all educational fields but the technical engineering subfields. We will thus as far as possible distinguish between men and women and relate the developments to the size of birth cohorts. Figure 4.1 below shows the development in number of registered students in absolute terms. Since we only have access to published aggregate data from 1813-1974, we separate men and women only after 1975.

Figure 4.1: Number of registered students, 1813-2012.



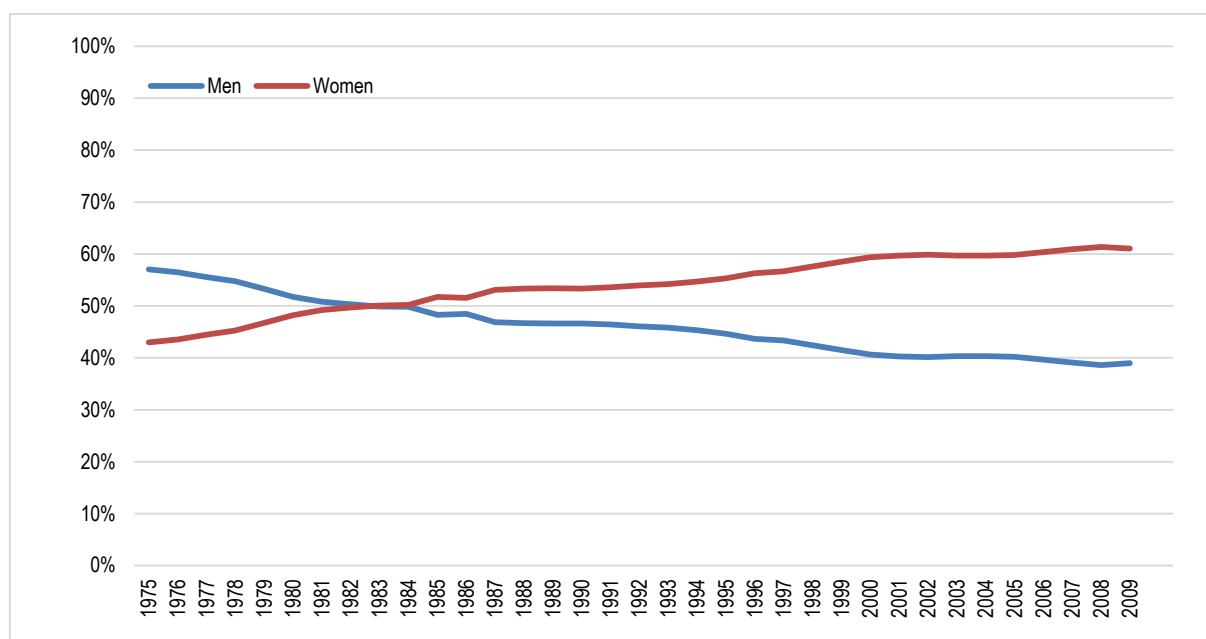
The numbers in the figure above are compiled from several sources for different years. 1813-1974: Historical statistics from Statistics Norway, <http://www.ssb.no/a/histstat/tabeller/5-16.html>. The numbers do not include all types of institution, and this gives a lower count for the later years. One registration is counted pr. each educational activity. Institutions included are universities and scientific university colleges. (Universitetet i Oslo, Universitetet i Bergen, Universitetet i Trondheim (Norges tekniske høgskole, Norges lærerhøgskole), Universitetet i Tromsø, Menighetsfakultetet, Norges veterinærhøgskole, Norges Handelshøyskole, Arkitektshøgskolen i Oslo (fra 1958), Norges idrettshøgskole (fra 1968), Musikkhøgskolen (fra 1973) og Statens kunstakademi (fra 1974)). 1975-2009: individual data from Statistics Norway analysed by the authors at CSP, HiOA. 2010-2012: aggregate data ordered for the NFHE project from Statistics Norway, Section for education statistics, Torill Vangen, 14.11.2013.

The number of registered students has grown considerably over the period 1975 to 2009. We can observe three different changes in the trends. The first period, from 1975 to the mid-1980s shows an expansion, but this expansion is not as steep as the following one. From the late 1980s, we observe a much more rapid growth, which seems to last until the early 2000s. Then, in the first half of the 2000s, the growth flattens out before a new period of rapid growth in the most recent “post-finance crisis” years.

Figure 4.1 shows that the number of female students grew faster than the number of male students, and that the number of women passed the number of men during the 1980s. Figure 4.2 shows the

development of the gender composition in more detail, and shows the share of male and female registered students in higher education for the years 1975-2009.

Figure 4.2: Share of women in higher education, registered students, 1975-2009.

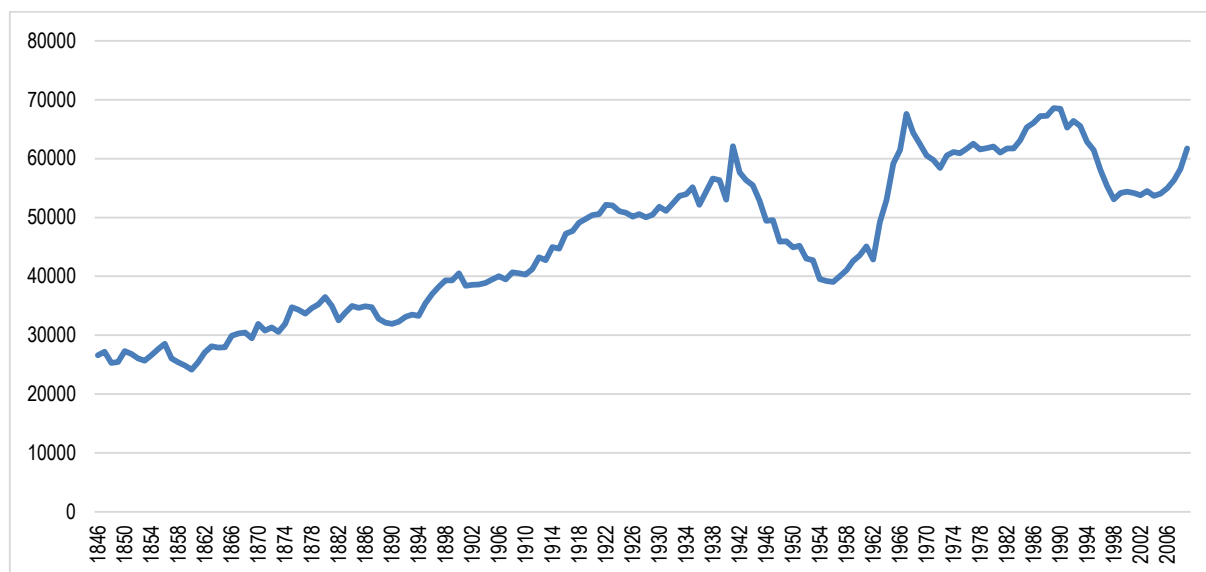


Register data from Statistics Norway, registered students by October 1.

These changes in the sex composition of the student population may partly be related to the institutional composition of the sector. From the 1970s, the growth was bigger in non-university institutions, and from 1975 most of the growth until 1987 came in this part of the sector. The period in which the number of women exceeds the number of men, thus, is the period when the female dominated fields of study expand (like nursing, social work, pre-school teaching etc.). The system of higher education is still remarkably gender segregated. Women are especially overrepresented in university college education at bachelor level. Here we find professional educations qualifying for caring work in the welfare state such as nursing, pre-school teaching and social work.

One possible explanation of the developments in figure 4.1 could be that the population also increased in this period. However, this is not a sufficient explanation, and the variation in the cohort sizes does not explain the growth of higher education. Figure 4.3 shows the yearly development of the number of twenty year olds in Norway.

Figure 4.3: Number of 20-years old, 1846-2009.

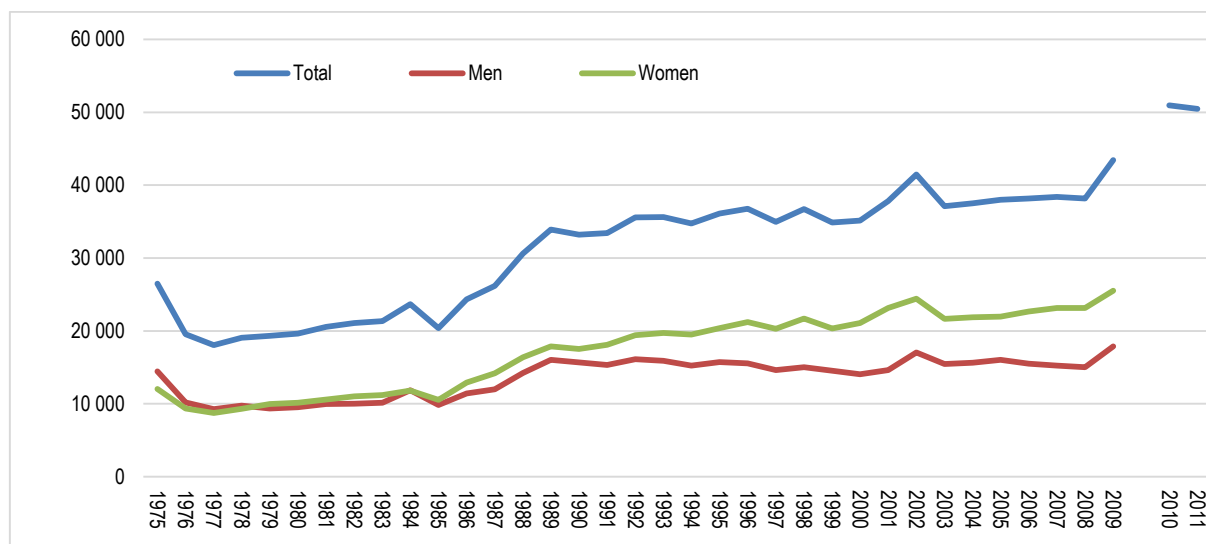


Statistics Norway, <https://www.ssb.no/tabell/05839>

From 1975, the figure shows some fluctuations. The number of twenty year olds peaked in 1989, with more than 68,000, and reached its lowest level of the period in 1995 at barely 53,000. The small growth in 20 year olds up until about 1989, cannot explain the expansion in number of students, and the relatively small cohort sizes in the mid-nineties were not accompanied by a downward trend in student numbers.

Another way to explore the numerical development of the system of higher education is by looking at the number of entrants. Figure 4.4 shows this development for the years 1975 to 2009.

Figure 4.4: Number of entrants, men and women, 1975-2011.



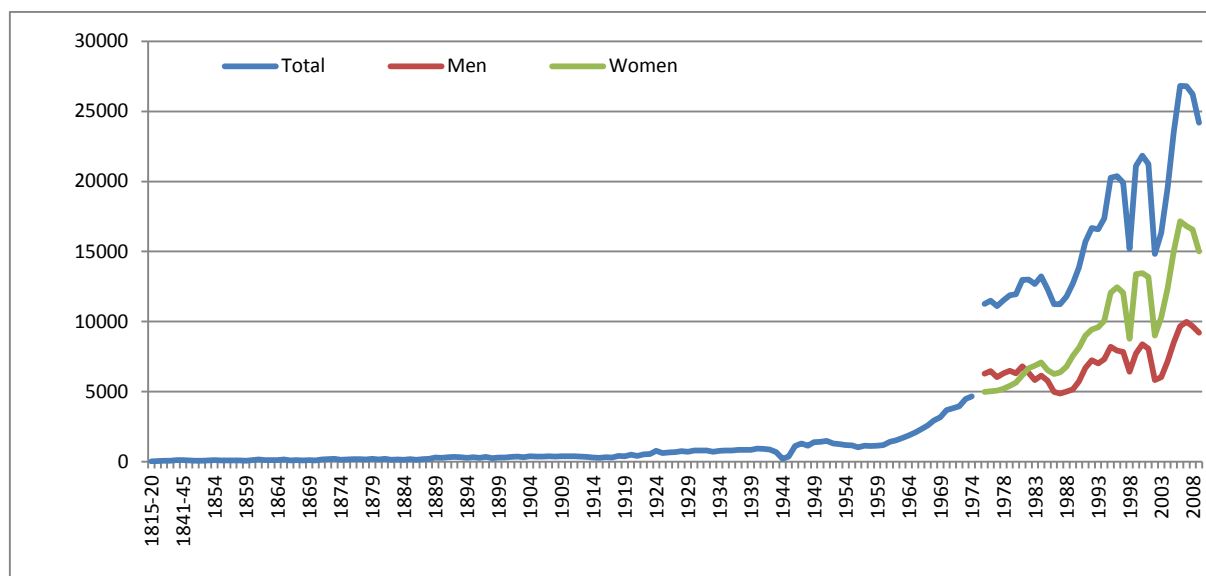
1975-2009: Register data from Statistics Norway, first entry for each student except Preparatory courses; Examen Philosophicum and Examen Facultatum, measured by October 1, 2010-2011: Source: Statistics Norway, Section for education statistics, Torill Vangen, 14.11.2013. Register data, new students by October 1 (entry on preparation courses not included). See Appendix.

The trend in the number of entrants is one of expansion, as also was the case for registered students. Unsurprisingly we see that women outnumber men somewhat earlier using this measure. We also observe a change in pace of expansion in the late 1980s.

The third way to measure the numerical development of the student population, that we present here, is the number of degrees awarded. Figure 4.5 shows this development in Norwegian higher education.

Since we only have access to individual record data after 1974, we are not able to distinguish between men and women before that.

Figure 4.5: Number of degrees awarded, men and women, 1815–2009.

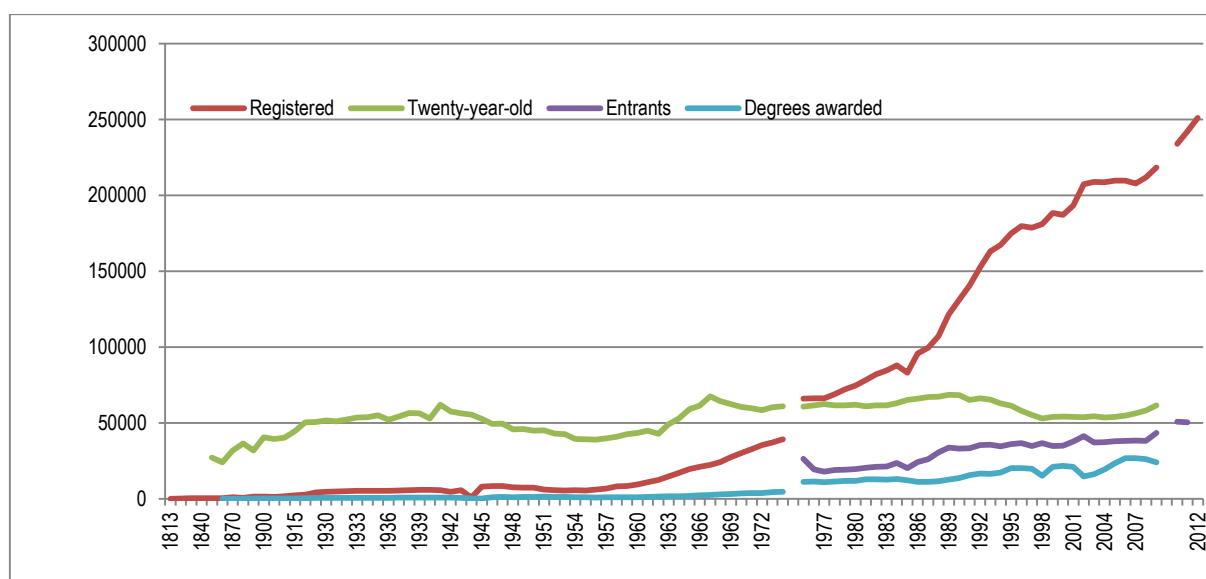


1815-1974: Statistics Norway, <http://www.ssb.no/a/histstat/tabeller/5-5-17t.txt>. The numbers do not include all types of degrees from all educational institutions, and give a lower count for the later years. Graduate students are included. 1975-2009: register data. All degrees awarded are included; the students who have several degrees are also counted several times.

Broadly speaking, we see the same development of rapid growth since the Second World War. The number of female graduates exceeds that of men during the 1980s, and we see some fluctuations around a strikingly strong increase in the absolute numbers of graduates.

Thus far, we have shown the developments in the different measures of the student population separately. In figure 4.6, we hold the three trends together, and compare them with the number of 20 year olds each year.

Figure 4.6: Number of 20 year olds, registered students, entrants, and degrees awarded, 1813-2012.



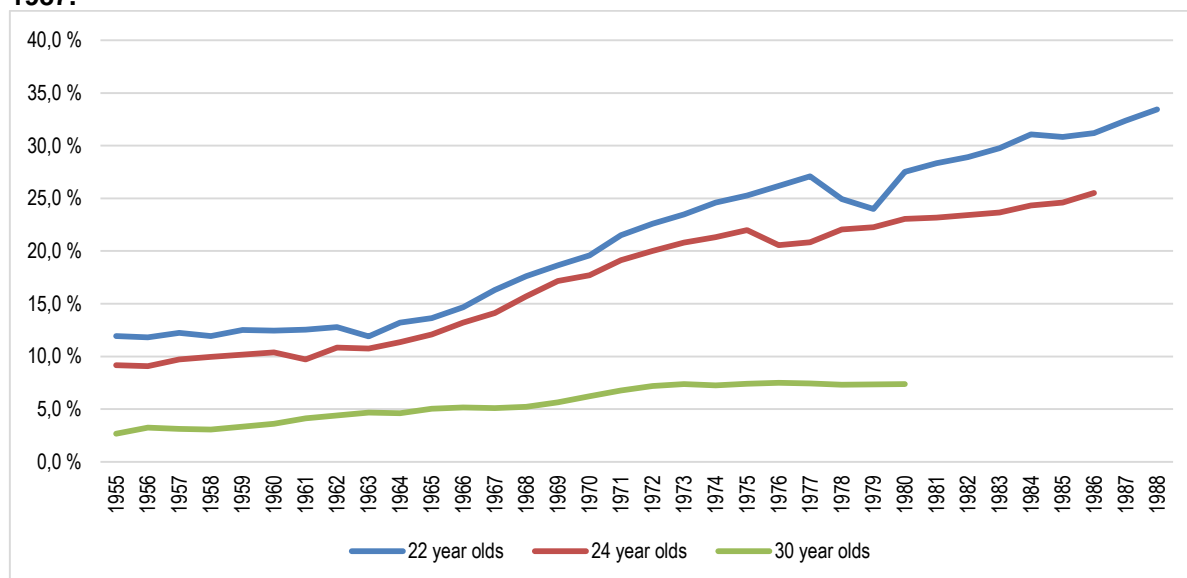
The figure sums up data from the previous figures.

The figure shows a considerable growth in the number of students. The growth in the number of registered students has been particularly strong. The number of 20 year olds, which has been declining rather than growing in the period, may not explain this development. The increase in the female participation is a more important factor, but the participation growth has been considerable among men as well.

4.3.2 Share of an age cohort

In order to look more closely into the connection, or lack of connection, between the demographic development in the Norwegian population, and the development of the size of the student population, we will present the shares of the different birth cohorts that enter higher education. Figure 7 shows the share of different birth cohorts that are registered students at different ages.

Figure 4.7: Share of each cohort in higher education at given moments, birth cohorts 1955–1987.

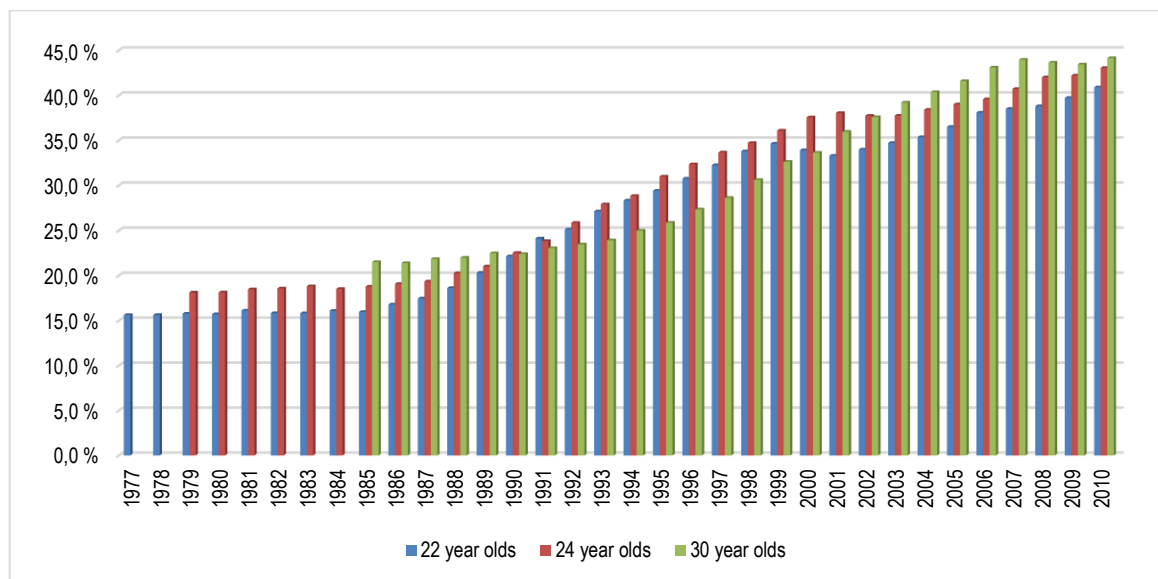


Register data from Statistics Norway, registered students by October 1. Figure shows share of population born between 1955 and 1987 in education at given age.

The figure shows that the shares of the cohorts that enter higher education have increased substantially, since the cohort born in 1955. This confirms the picture depicted above, which indicated that the growth in the higher education system is due to increased participation, and not to a sheer growth in the population.

In figure 4.8, we show the same development in a slightly different way. We have estimated the shares of the different birth cohorts that have been registered students within the year they reach different ages. It is thus a more cumulative measure than the measure used in figure 4.7 above.

Figure 4.8: Share of cohort for 22 year olds, 24 year olds, and 30 year olds having attended higher education, 1977–2010.



Register data from Statistics Norway, registered students by October 1. Figure shows share of population that has attended higher education at given age.

The figure shows a similar pattern to that of figure 4.7, but when we use a cumulative measure the 30 year olds are the ones with the largest proportion who have attended higher education. We also observe considerable differences between the eldest and the youngest cohorts. More than 40 per cent of the youngest cohort has attended higher education by the age of thirty, whereas less than a quarter of the eldest cohort has done the same.

4.3.3 Conclusions

In this section, we have seen a tremendous growth in the number of students in Norwegian higher education. In the period 1975 to 2009, we observe three different changes in the trends. In the first period, from 1975 to the mid-1980s there was an expansion, but not as steep as in the following period. From the late 1980s, there was a much more rapid growth, which lasted until the early 2000s. Then the growth flattened out before a new period of rapid growth in the most recent “post-finance crisis” years. One aspect of this growth is the number of female students that surpassed the number of male students during the 1980s. A growing population may however, only to a very limited degree explain the growth of the system, and the growth in different numbers of students have been far greater the growth in the population in particular (student typical) age groups.

4.4 Type and level of studies

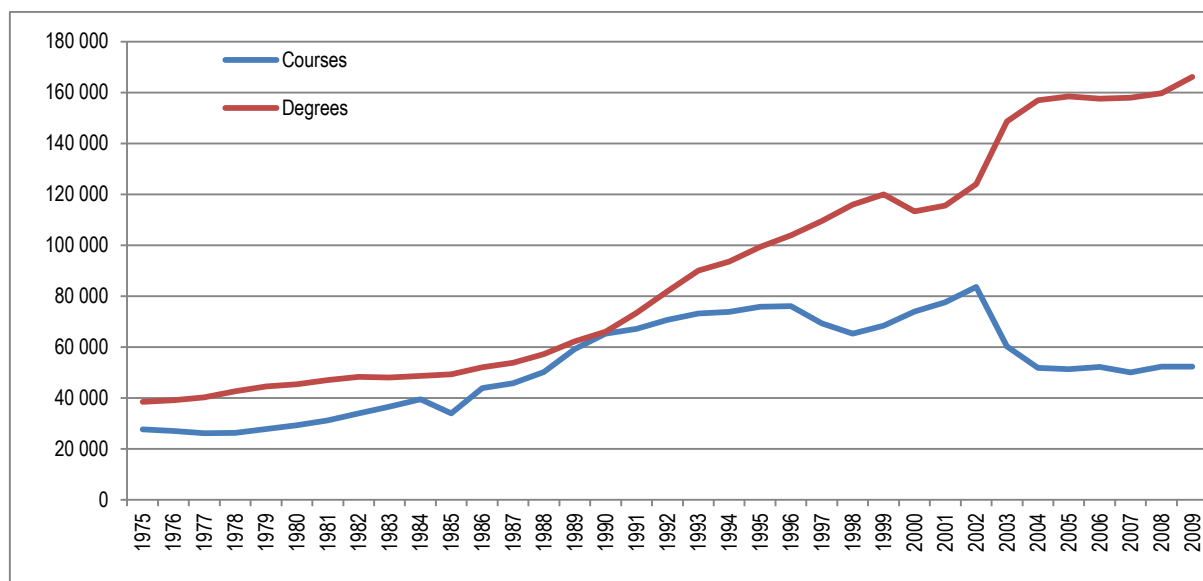
4.4.1 Types of studies

In this section, we will look more closely into how the numbers of registered students vary between types and levels¹⁰ of higher education. We separate courses and degrees. This distinction is, in the Norwegian context, not as clear-cut as it may seem. Before the “quality reform” in 2003, students at the university faculties for humanities, social sciences and science and mathematics would choose courses that eventually could add up to a degree at the BA level (cand.mag.). After the 2003 reform, these faculties also established bachelor’s degrees that the students follow from day one. We would thus expect to find a decrease in courses after the introduction of the quality reform, and a similar

¹⁰ Here we suspect that there are inaccuracies in the Norwegian data. The institutions’ registrations of whether students are enrolled in courses or degrees are inaccurate and vary between institutions.

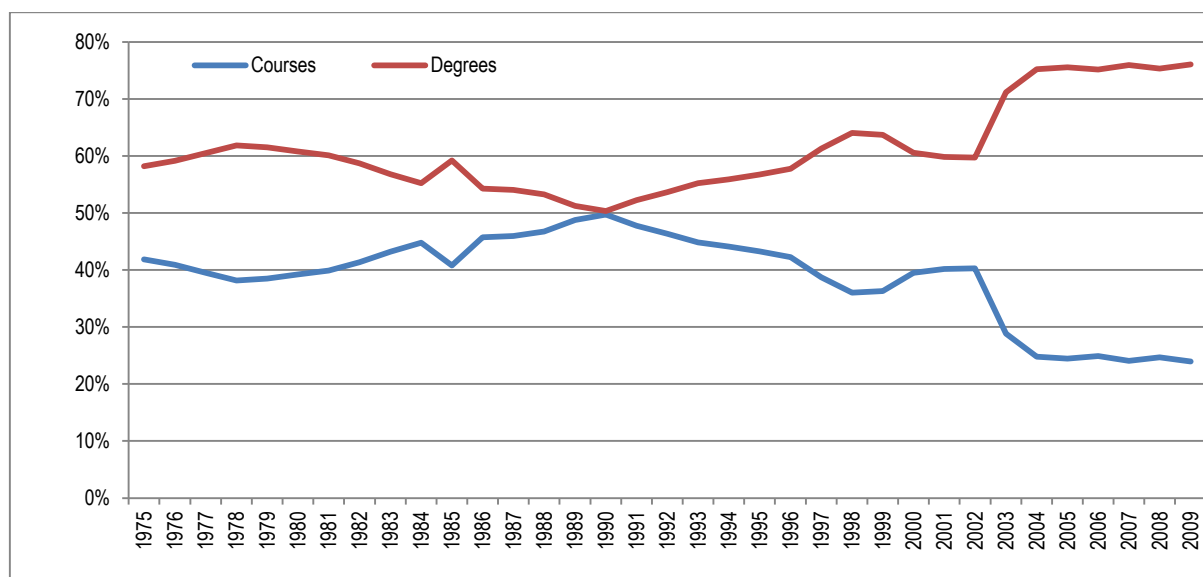
increase in the number of students studying for degrees. Figure 4.9 shows the development in actual numbers, whereas figure 4.10 shows the same development in relative terms.

Figure 4.9: Students by type of studies, 1975–2009. Numbers.



Register data from Statistics Norway, registered students by October 1.

Figure 4.10: Students by type of studies, 1975–2009. Shares.



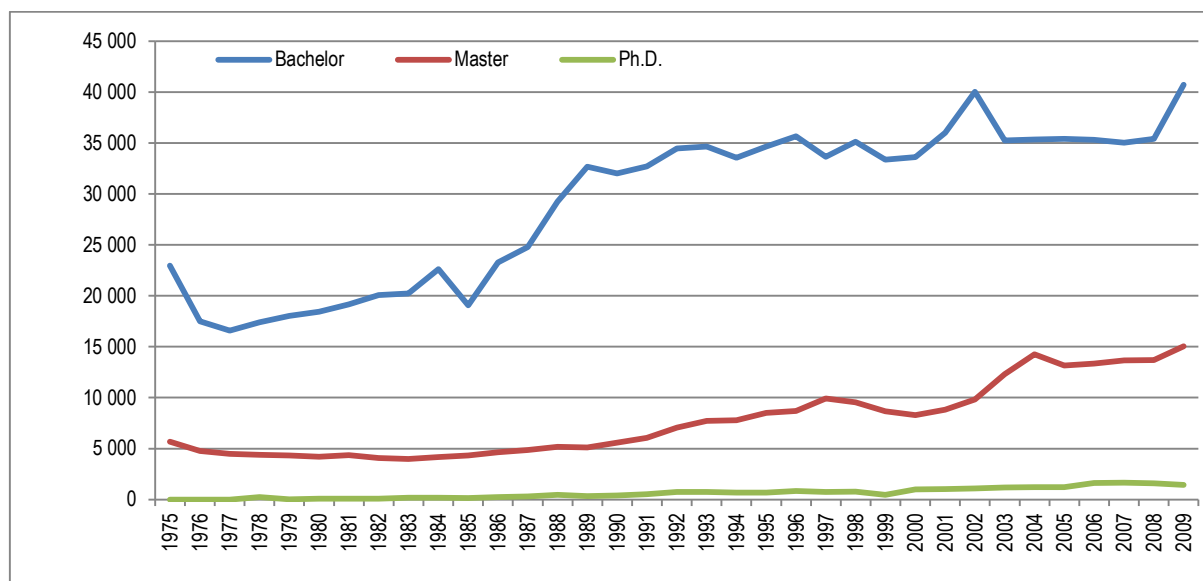
Register data from Statistics Norway, registered students by October 1.

The shares in degrees and single courses were identical in 1990. In the years before 1990, the share in degrees was bigger, and the same was the case after 1990. As expected, the differences between the two types of study increased sharply after the introduction of the Bologna adapting quality reform in 2003.

4.4.2 Level of studies

In the following figures, we examine the number of entrants into a new level of higher education. We include the students the first year (per October 1) they are registered at a new level of higher education. That is, the first year they are registered at BA level, the first time at MA level and the first time at PhD level.

Figure 4.11: Student entrants by level of studies, 1975–2009. Numbers.

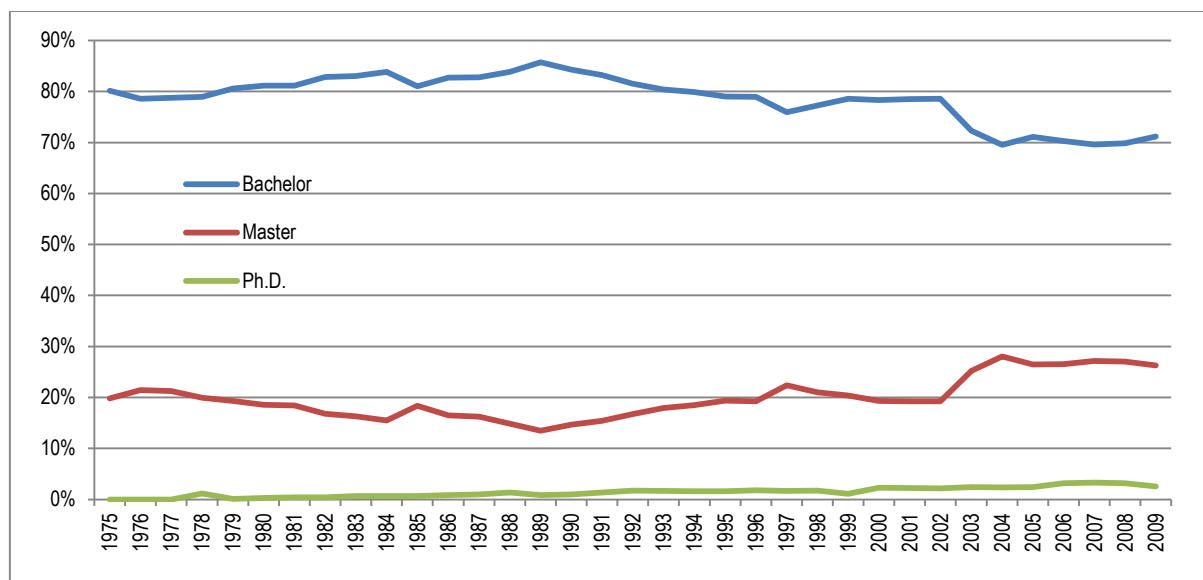


Register data from Statistics Norway, first entry for each student except Preparatory courses; Examen Philosophicum and Examen Facultatum, measured by October 1.

The unsurprising result in the figure is that the number entering BA level studies are considerably higher than the number entering higher-level studies. We also see that the increase in the 1980s was particularly strong at the BA level. Later on, in the 1990s, the number of students at the MA level increased, whereas the number of PhDs increased from the turn of the century.

Figure 4.12 shows the same development as in figure 4.11, in relative terms.

Figure 4.12: Student entrants by level of studies, 1975–2009. Shares.



Register data from Statistics Norway, first entry for each student except Preparatory courses; Examen Philosophicum and Examen Facultatum, measured by October 1.

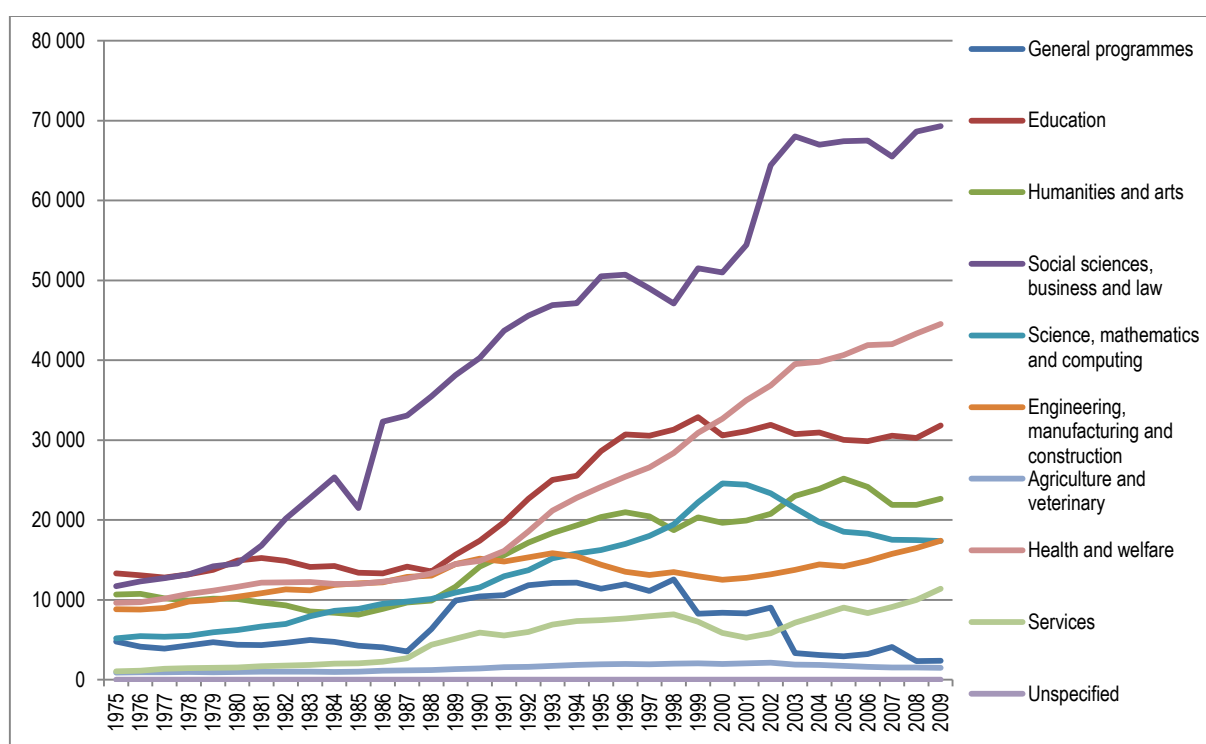
The figure shows that the proportion of students on BA level increased a bit during the 1980s, and that the proportion of entrants into the higher levels increased later in the period; first at the master's then also at PhD level.

4.5 Fields of study

4.5.1 A general overview

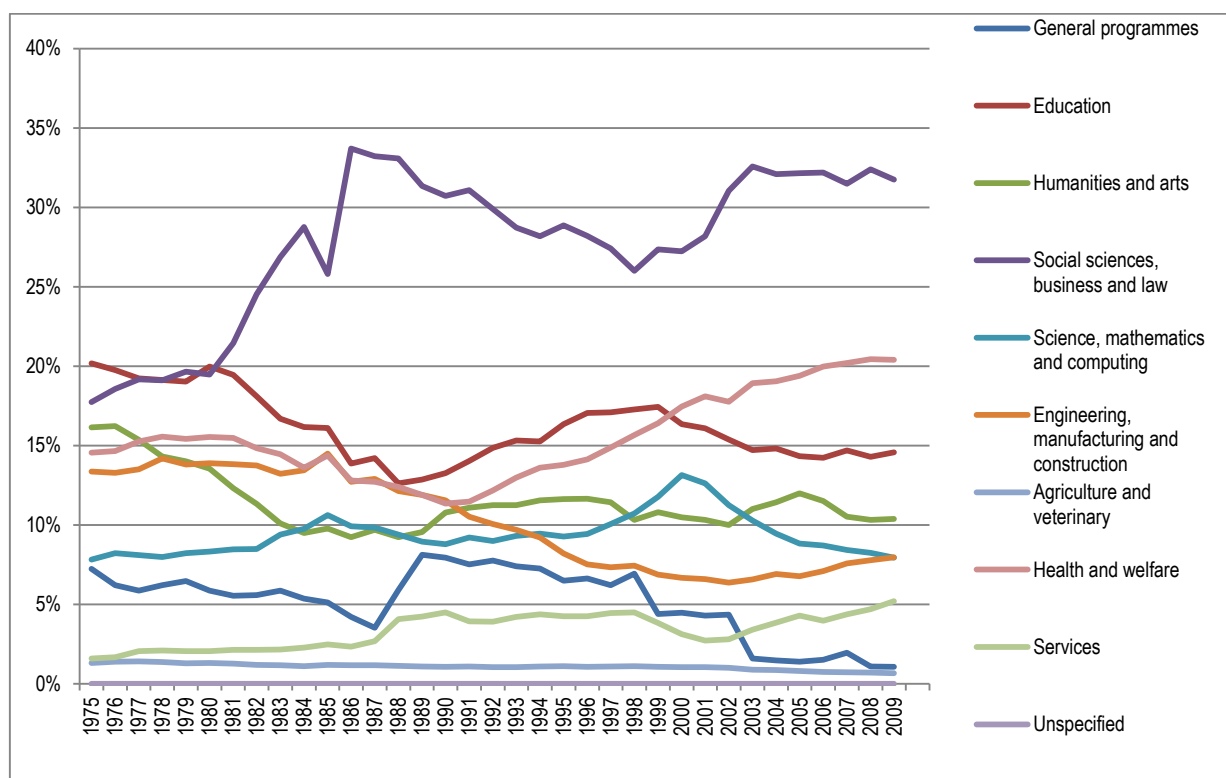
Below we present how the number of registered students varies over time between different educational fields. All higher education is included. Since the first three digits of ISCED give a large number of fields, we first present the fields separated at the second digit level. We have included both level 5 and 6, since the number of registrations at level 6 is very small in most years. Then we present separately for each field, the different sub-fields on the third digit, and in some cases on the fourth digit. Figure 4.13 and 4.14 show the development in the educational fields on the second ISCED 97 digit. We present both the development in total numbers and in relative shares (percentages of the total student population). Figure 4.13 shows the total numbers of registered students in each educational field in the years 1975 to 2009. Figure 4.14 shows the same development in percentages.

Figure 4.13: Students by field of study, 1975–2009. Numbers.



Register data from Statistics Norway, registered students by October 1

Figure 4.14: Students by field of study, 1975–2009. Shares in per cent.



Register data from Statistics Norway, registered students by October 1.

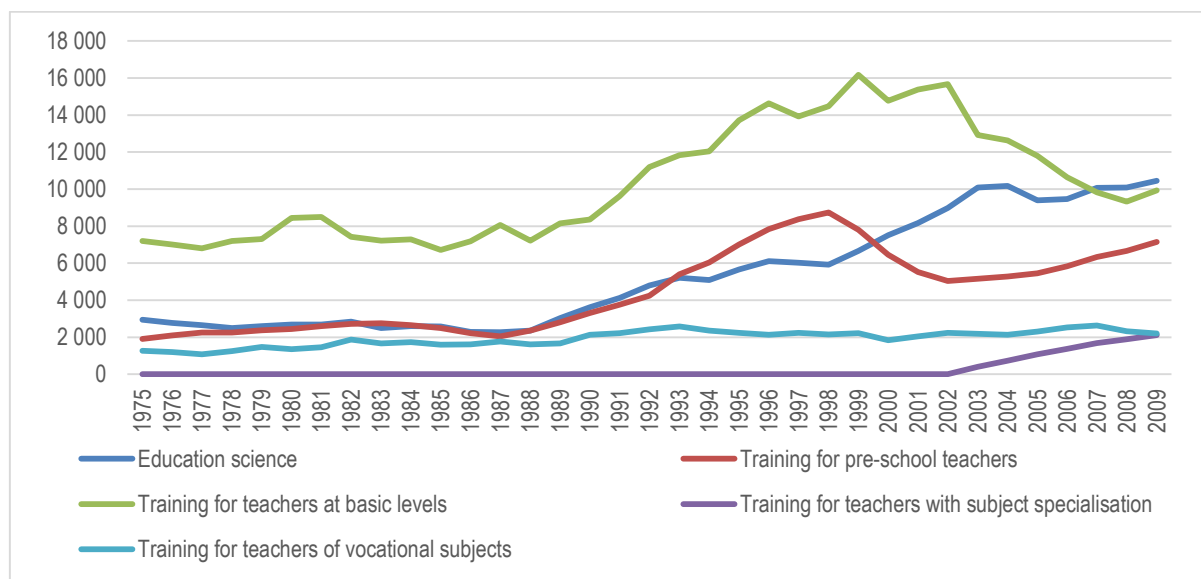
The general picture is that the biggest growth (both relatively and in absolute numbers) has been in the field of Social science, business and law. There has also been some growth in studies in Health and welfare. Education and Science, mathematics and computing both experienced rapid growth in the late 1980s and in the 1990s, but have since experienced a flattening out, or even a decline in the student numbers. Relative to the other fields the student numbers in education has declined. In Humanities and arts and in Engineering, manufacturing and construction there has been an increase in the absolute number of students, but a decline in the relative shares.

Below, we present the number of registered students in different sub-fields (ISCED third digit) separately for each of the six largest fields shown above (i.e. Education, Humanities and arts, Social sciences, business and law, Science, mathematics and computing, Engineering, manufacturing and construction and Health and welfare). For some of the fields we have to some extent separated between subfields at the fourth digit as well.

4.5.2 Education

In figure 4.15, we saw that the number of registered students in Education was quite stable for the period 1975-1988, just below 15,000. After this, the number of students more than doubled in the years 1988 to 1999, to more than 30,000 students, before a new more or less stable period from 1999 to 2009. Within the field Education, we find only one type of education based on the third ISCED digit. We have therefore expanded the classification of this educational field to the fourth digit in ISCED 97.

Figure 4.15: Students in Education, 1975–2009. Numbers.



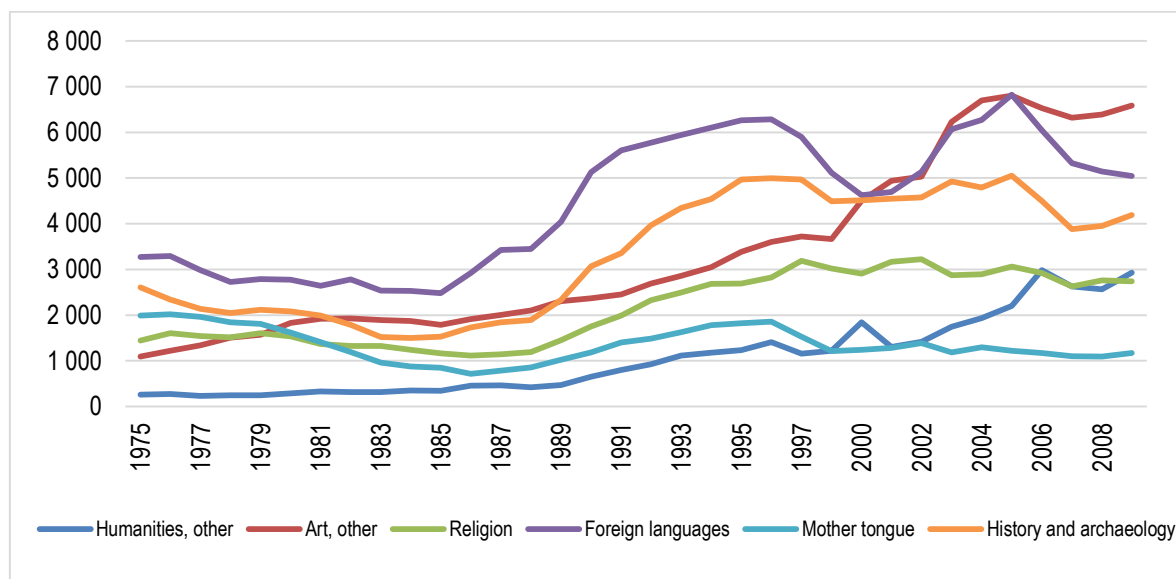
Register data from Statistics Norway, registered students by October 1.

The figure shows some internal differences between subfields. Training for teachers at the basic level has experienced a drop in student numbers since the turn of the century, after a large increase in the preceding period. In Educational science on the other hand, we have seen a considerable increase during the entire period. The development in the Training for pre-school teachers has been similar to that of Primary school teachers, but the drop in student numbers was not as large and was of shorter duration.

4.5.3 Humanities and arts

Within the field of Humanities and arts there are three sub-fields at the third digit level; Arts, Humanities and the broad Humanities and arts. In figure 4.16, we make some separation between subfields at the fourth digit level within the humanities. We will then separate between Arts, Foreign languages, History and archaeology, Mother tongue (mainly Nordic languages), and Other humanities. The latter includes the fourth digit subfields Humanities and arts (ISCED 200, 299), Humanities (broad programmes) (ISCED 220 and 224) and Philosophy and ethics (ISCED 226). In 1999, there seems to be an error in the registrations, so this year is excluded from the figure. The number of registered students in Humanities in total has dropped somewhat from 1975 to 1984, before the numbers grew, and almost tripled from 1985 to 1996. The number of students has grown in Foreign languages and in History and archaeology. For the sub-field Mother tongue the number of students has dropped. In Arts there has been a more or less steady growth of registered students throughout the period, a bit steeper from 1999, followed by a stable period from 2004. From 2003, we see an increase in the category Humanities, other, which is mainly due to a corresponding increase in several unclassified humanities bachelor's degrees and bachelor's degrees in Area studies (like Africa-, Asia-, America- or Europe-studies).

Figure 4.16: Students in Humanities and arts, 1975–2009. Numbers.

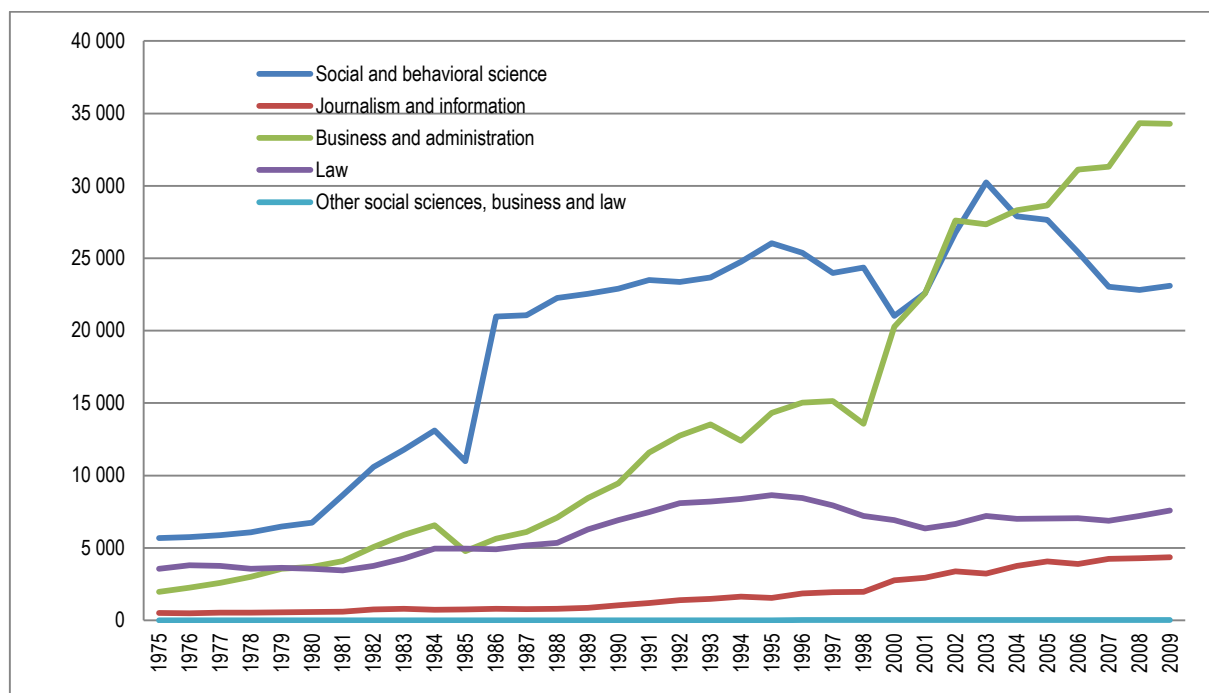


Register data from Statistics Norway, registered students by October 1. Humanities, other includes: Humanities and Arts (ISCED* 200, 299), Humanities (broad programmes) (ISCED* 220 and 224) and Philosophy and ethics (ISCED* 226). Arts, other includes: Arts (broad programmes) (ISCED* 210), Fine Arts (ISCED* 211), Music and performing arts (ISCED* 212), Audio-visual techniques and media production (ISCED* 213), Design (ISCED* 214), Craft skills (ISCED* 215). Numbers for the year 1999 are not included due to errors in registrations. *based on second, third and fourth number in ISCED within higher education.

4.5.4 Social sciences, business and law

There are five sub-fields within the educational field Social science, business and law: Social and behavioural science, Journalism and information, Business and administration, Law, and Social science, business and law. Due to registration errors, numbers from 1999 are excluded. The broad other Social science, business and law-category is very small. The smallest of the remaining categories is Journalism and information, and here we see a steady growth, a bit steeper for the years after 1999. The graph that shows registered students in Law shows a more stable trend, with a slight growth until 1995, followed by a slight downwards trend. The growth in Business and administration has been tremendous; the growth increases from 1998 and the subfield is the largest category at the end of the period. Business and administration passes the other large category, social and behavioural science, in 2004. The latter category has also grown, but more unevenly, and from 2003, we observe a downward trend in the number of registered students.

Figure 4.17: Students in Social sciences, business and law, 1975–2009. Numbers.

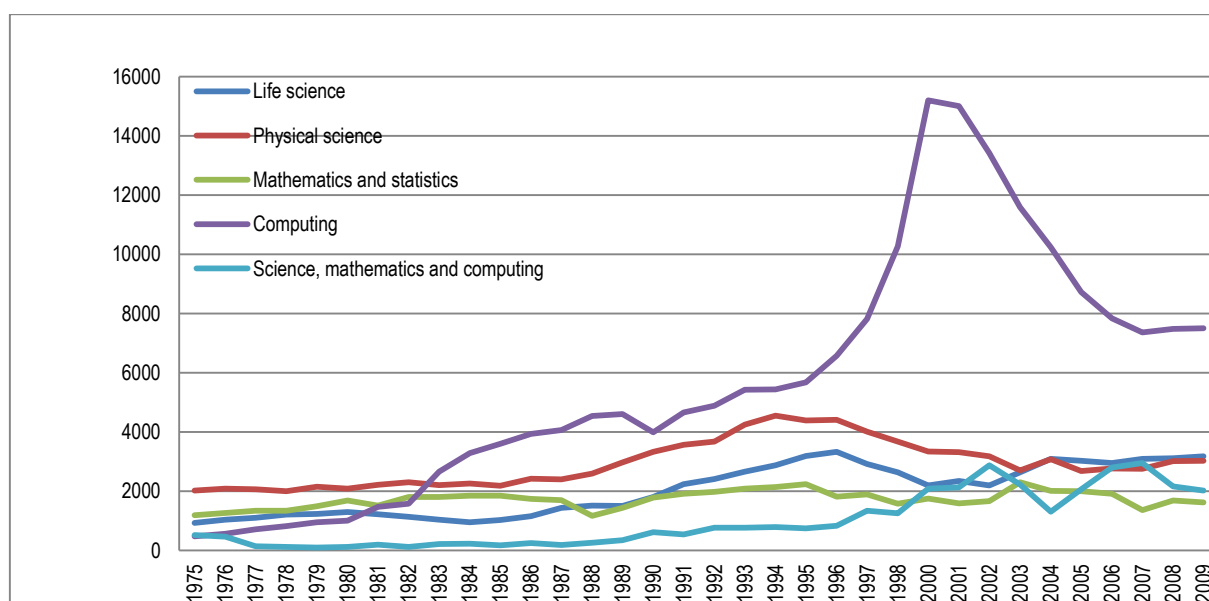


Register data from Statistics Norway, registered students by October 1. Numbers for the year 1999 is not included due to errors in registrations.

4.5.5 Science, mathematics and computing

The educational field of Science, mathematics and computing is divided in five subfields at the three-digit level: Life science, Physical science, Computing, Mathematics and statistics, and a rest category called Science, mathematics and computing. Like in Arts and humanities, there seems to be an error in the data in 1999, and we therefore exclude numbers for this year from the figure. The most striking development is in the subfield Computing, which experienced an enormous growth in the number of students until the years around the burst of the dotcom bubble, which was followed by a decline in student numbers. The figure also shows that life science tripled from the mid-1980s to 2009.

Figure 4.18: Students in Science, mathematics and computing, 1975–2009. Numbers.



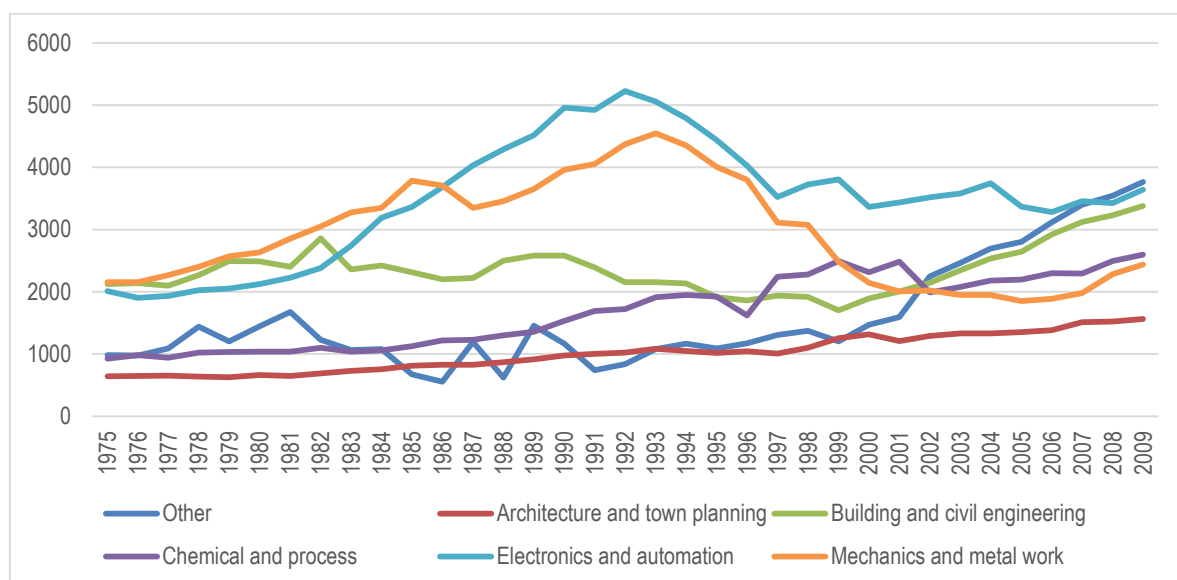
Register data from Statistics Norway, registered students by October 1. Numbers for the year 1999 is not included due to errors in registrations.

4.5.6 Engineering, manufacturing and construction

By combining information on the second, third and fourth digit of ISCED 97, we have divided the field of Engineering, manufacturing and construction into the following six subfields: Architecture and town planning, Chemical and process, Mechanics and metalwork', Electronics and automation', Building and civil engineering', and Other engineering fields. The latter category includes Engineering, manufacturing and construction (ISCED 500 and 599), Engineering and engineering trades (broad programmes) (ISCED 520 and 529), Electricity and energy (ISCED 522), Motor vehicles, ships and aircraft (ISCED 525), Food processing (ISCED 541), Textiles, clothes, footwear, leather (ISCED 542), and mining and extraction (ISCED 544).

The subfields Mechanics and metalwork and Electronics and automation had an increase until the early 1990s, and thereafter the numbers fell. The falling numbers were particularly apparent in Mechanics and metalwork. The number of students in Building and civil engineering sinks during the 1990s, and rises again in the last decade. Architecture and town planning and Chemical and process have both a smaller, but more or less constant, growth throughout the period. During the 2000s, the subfield labelled Other went through a rapid growth, and this is the largest subfield at the end of the observation period. This growth is mainly due to an increase in student numbers in studies within Energy and environment and within Offshore and marine technology'.

Figure 4.19: Students in Engineering, manufacturing and construction, 1975–2009. Numbers.

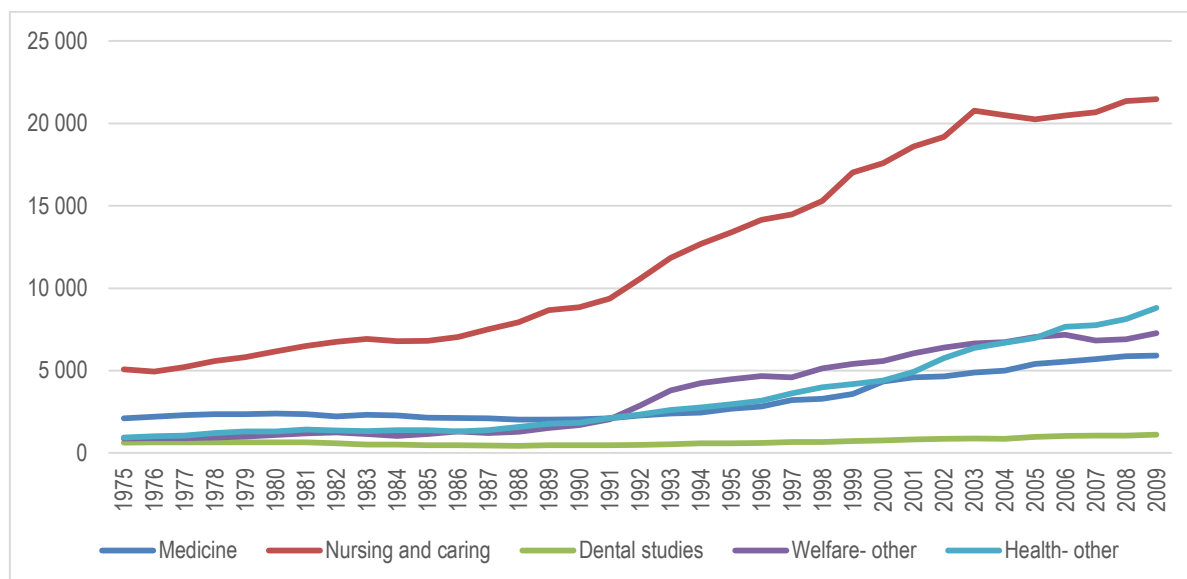


Register data from Statistics Norway, registered students by October 1. Other includes: Engineering, Manufacturing and Construction (ISCED* 500 and 599), Engineering and engineering trades (broad programmes) (ISCED* 520 and 529), Electricity and energy (ISCED* 522), Motor vehicles, ships and aircraft (ISCED* 525), Food processing (ISCED* 541), Textiles, clothes, footwear, leather (ISCED* 542), Mining and extraction (ISCED* 544). *based on second, third and fourth number in ISCED within higher education.

4.5.7 Health and welfare

We have divided the field of Health and welfare into five subfields by use of information on the second, third and fourth digit of ISCED 97. The five fields are Medicine, Nursing, Dental studies, Welfare studies and Other health studies. The decidedly largest subfield is Nursing, which had a marked increase in student numbers during the 1990s. The number of students in Dental studies has on the other hand, been almost constant throughout the period. In Welfare studies, Medicine and in Other health studies, there have been marked increases, albeit slower than in the subfield of Nursing.

Figure 4.20: Students in Health and welfare, 1975–2009. Numbers.



Register data from Statistics Norway, registered students by October 1. Health- other includes: Medica diagnostic and treatment technology (ISCED* 725), Therapy and rehabilitation (ISCED* 726), Pharmacy (ISCED* 727), Health and Welfare (ISCED* 799), Health (broad programmes) (ISCED* 720). Welfare- other includes: Child care and youth services (ISCED* 761), Social work and counselling (ISCED* 762). *based on second, third and fourth number in ISCED within higher education.

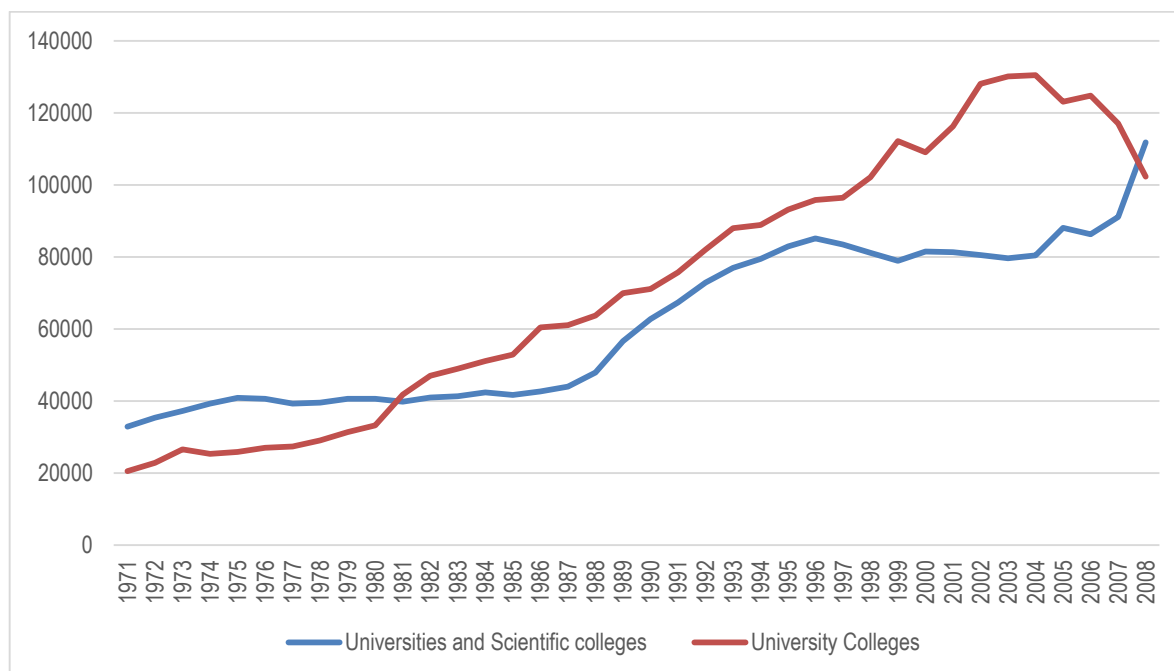
4.5.8 Conclusions

In this section, we have examined the developments in the numbers of registered students across educational fields at the second, third and fourth digit in the ISCED 97 classification. In most fields, the number of students has increased in the observation period. However, we have also seen considerable differences between fields and subfields. In some fields, the growth has been strong and consistent, in other fields the number of students has declined, whereas in yet other fields the numbers have fluctuated. We have seen some obvious trends, such as an enormous growth in Computing up until the dotcom bubble burst. We have also seen tremendous growth in Business administration and Health, whereas student numbers are declining in Agriculture, and in some engineering subfields like Mechanics and metalwork and Electronics and automation.

4.6 Institutional landscape

In this section, we will examine the numerical development in different types of higher education institutions. The individual level register data on Norway does not include information about educational institutions before 1995. The Norwegian university colleges were established in the mid-nineties as a result of large mergers in the sector, in which the old district colleges merged with the specialised institutions educating teachers, nurses, engineers, etc. At the aggregate level, however, Statistics Norway has published numbers of students enrolled in either a university college or a university (or specialised universities/scientific college).

Figure 4.21: Students by type of higher education institution, 1971–2007. Numbers.



Statistics Norway: <http://www.ssb.no/a/histstat/tabeller/5-14.html>. Before 1990, each student could be registered for several “educational activities.” From 1990, there is one “educational activity” counted each year. Scientific colleges includes Norwegian School of Economics(NHH), MF Norwegian School of Theology, Norwegian School of Veterinary Science, The Oslo School of Architecture and Design, Norwegian School of Sport Sciences, Norwegian Academy of Music and from 2008 BI Norwegian Business School and School of Mission and Theology. Ph.D.: not included from 2002. Courses from BI: included from 2002. From 2005 and onwards, University of Stavanger (previously Stavanger University College), Norwegian University of Life Sciences (previously Agricultural University of Norway) counted as Universities. In 2007, University of Agder (previously Agder University College) counted as University.

Prior to 1971, the university colleges counted as vocational schools and not as tertiary education. Institutions that earlier were regarded as upper secondary education were from 1981 onwards upgraded to the tertiary level. This includes schools for nurses, social educators, radiographers, opera singers and actors. At the same time, the students in university colleges outnumber university students. At the end of the period, some former university colleges (in Stavanger, Agder, and Bodø) gain university status, and then the number of university students is again larger.

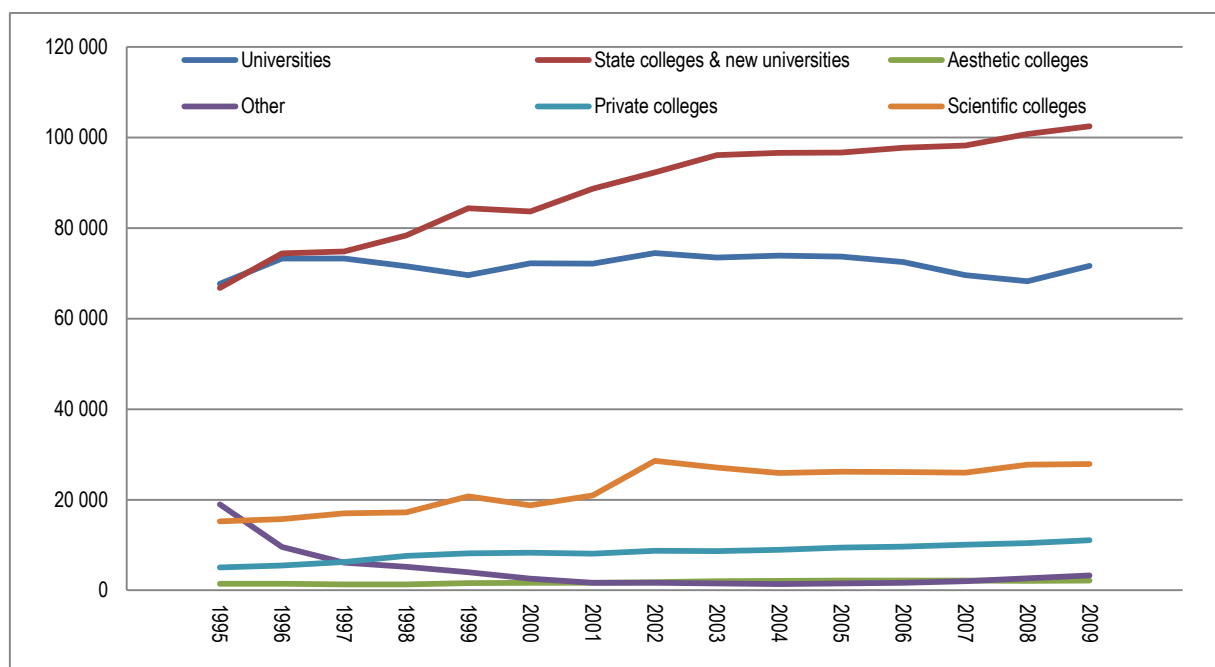
4.6.1 A typology

The Norwegian register data does not include information about educational institutions before 1995, and the remainder of this section will focus on the period from the mid-1990s onwards. Here we will hold the institutional classification constant, even though some institutions have changed status during the period. We have made a classification of institution type that consists of six types of institution. Until quite recently Norwegian higher education consisted of only four universities, several scientific colleges (more specialised institutions at university level) and a number of state colleges spread across the country. In recent years, three state colleges and one scientific college have been granted university status. In our classification, we keep the old distinction and distinguish between “old universities”, “scientific colleges” (still including NMBU (the former scientific college for agricultural science)), and “state colleges and new universities”. In addition, we have distinguished between “aesthetic colleges” (art schools etc.), “private colleges” (mostly religious colleges) and an “other” category (consisting of institutions like the police academy, the customs academy, military academies etc.). More details on this classification proposal are to be found in the appendix.

4.6.2 The development of types of institutions

In figure 4.22 and 4.23, we present the absolute numbers of students at different types of higher education institutions in the years 1995 until 2009, and the same development in relative shares. The figures show that the “state colleges and new universities” category is the institution type with the largest number of students of all the categories throughout the period. These institutions have experienced a considerable growth in the number of students since their establishment in the mid-nineties. Second largest are the universities, which have had a quite stable number of students in this period compared with the university colleges. The aesthetic colleges category has a small number of registered students, the private colleges a bit more, and a slight upward trend. The scientific colleges had a steep growth from 2001 to 2002, from a small growth in the years before, and then stabilise. The “other” category, which includes students registered in higher education without information about institution, decreased during the first five to six years, a drop that may partly be explained if the registration of institution improved during the first years after this information were included in the registers.

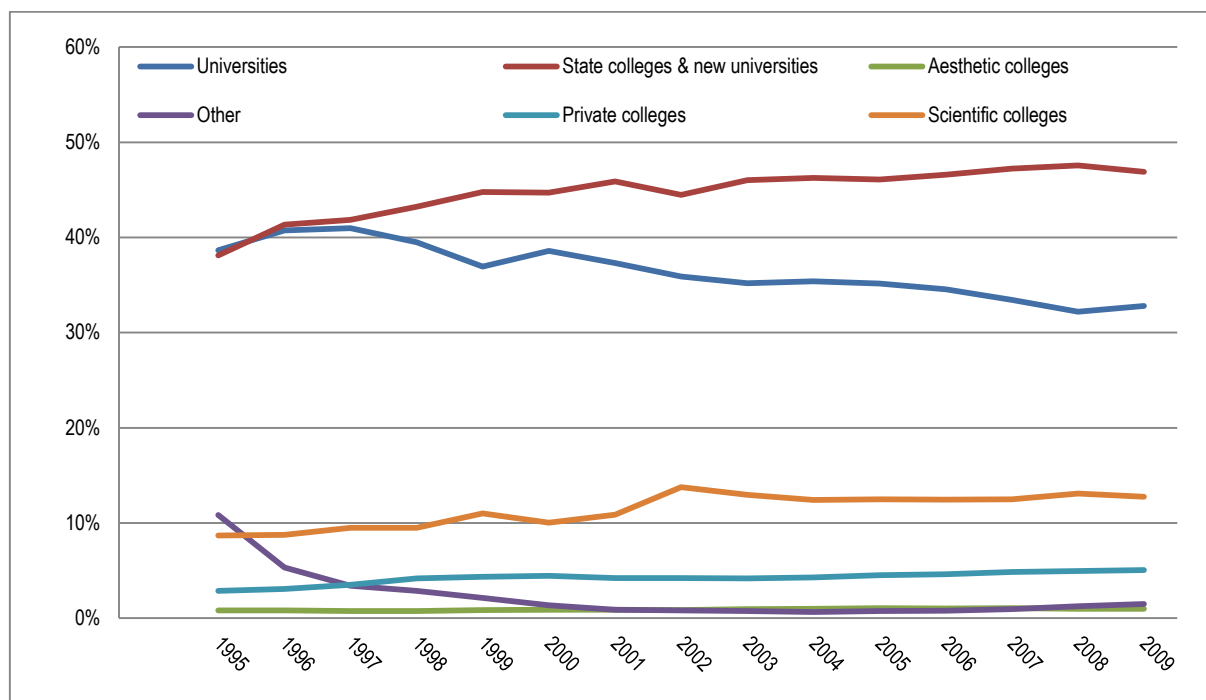
Figure 4.22: Students by type of higher education institution, 1995–2009. Numbers.



Register data from Statistics Norway, registered students by October 1. In 'Other' students with unknown educational institution is included.

The overview of the shares for the same years confirms the findings:

Figure 4.23: Students by type of higher education institution, 1995–2009. Shares in per cent.

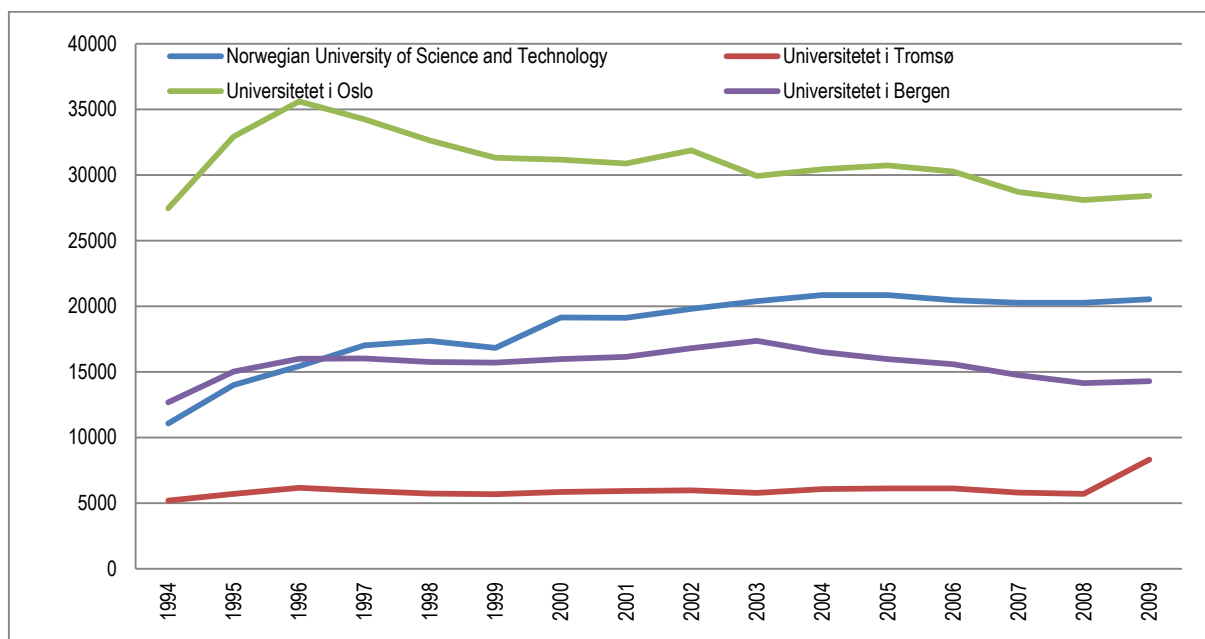


Register data from Statistics Norway, registered students by October 1. In “Other” students with unknown educational institution is included.

In relative terms, we see that the universities are serving a smaller share of the student population while the other institution types are either stable or increasing their share of the total student population.

Whether these development patterns are common for all the institutions in an institution type, or if the changes are due to changes in only one or some of the institutions, may vary. In order to examine these trends in more detail, we present the number of students in each institution separately by institution type. We begin by presenting the development in the number of students at the four “old” universities, in figure 4.24.

Figure 4.24: Students by Universities, 1994–2009. Numbers.



Register data from Statistics Norway, registered students by October 1.

Within the universities, we see a trend of stability, and that the picture of a decline in registered students is explained by a decline in registered students at the University of Oslo, and not the other universities. At NTNU (Norwegian University of Science and Technology) in Trondheim, there was a growth during the period, steeper for the period of 1994 to 2000, and then a more stable trend. The University of Bergen had a slight growth from 1994 to 2003, followed by a slight downward trend. The smallest university, the University of Tromsø, had stable student numbers, until 2009, when it peaked due to the incorporation of the Tromsø University College.

Figure 4.25 shows the development for the 26 (at the beginning of the period) public university colleges and the new universities. These institutions were the result of a reform in the university colleges, where several different institutions in each county merged. The different institutions educating teachers, nurses, social workers, engineers etc. were merged with each other and with the regional colleges. This reduced the number of institutions considerably, but there were still at least one university college in every county. Partly because of their history (which institutions that merged) and their regional belonging, the university colleges vary a lot, both in content and size. Combined with the large number of such institutions this makes the figure very complex, and we have thus separated the figure in two according to institution size.

Figure 4.25a: Students by State colleges & new universities, 1994–2009. Numbers.

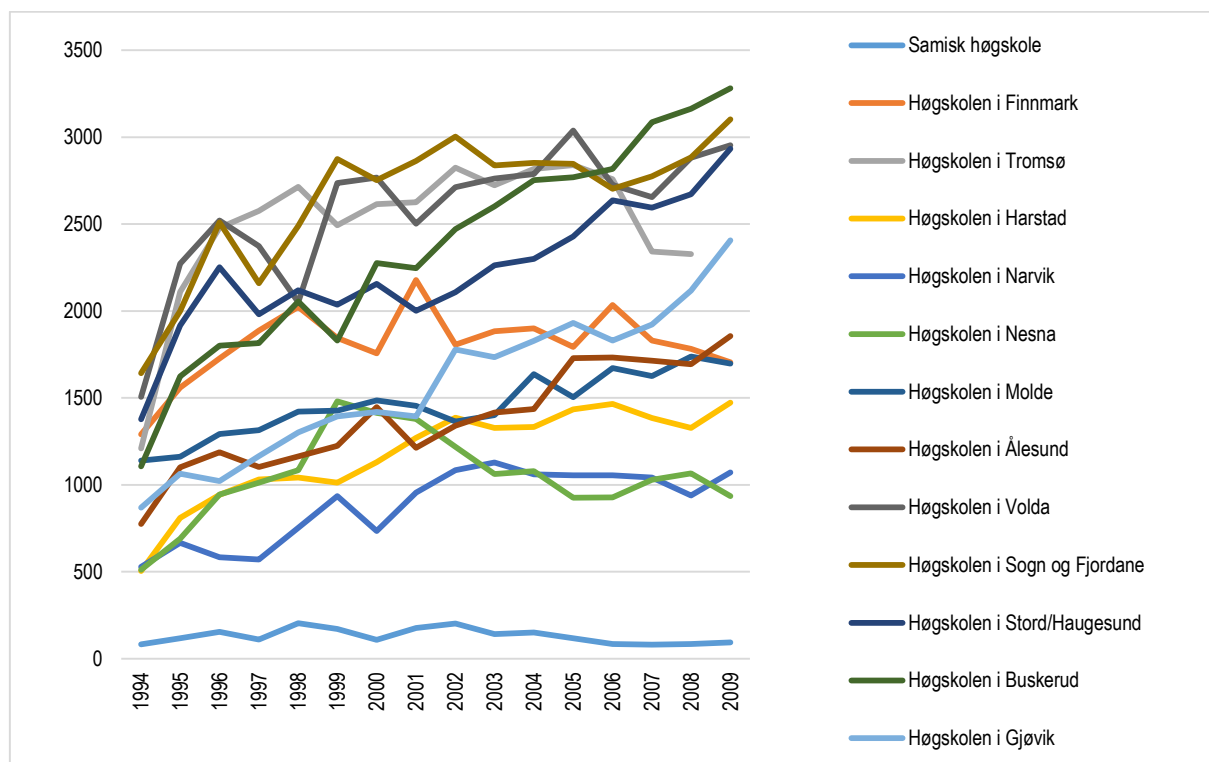
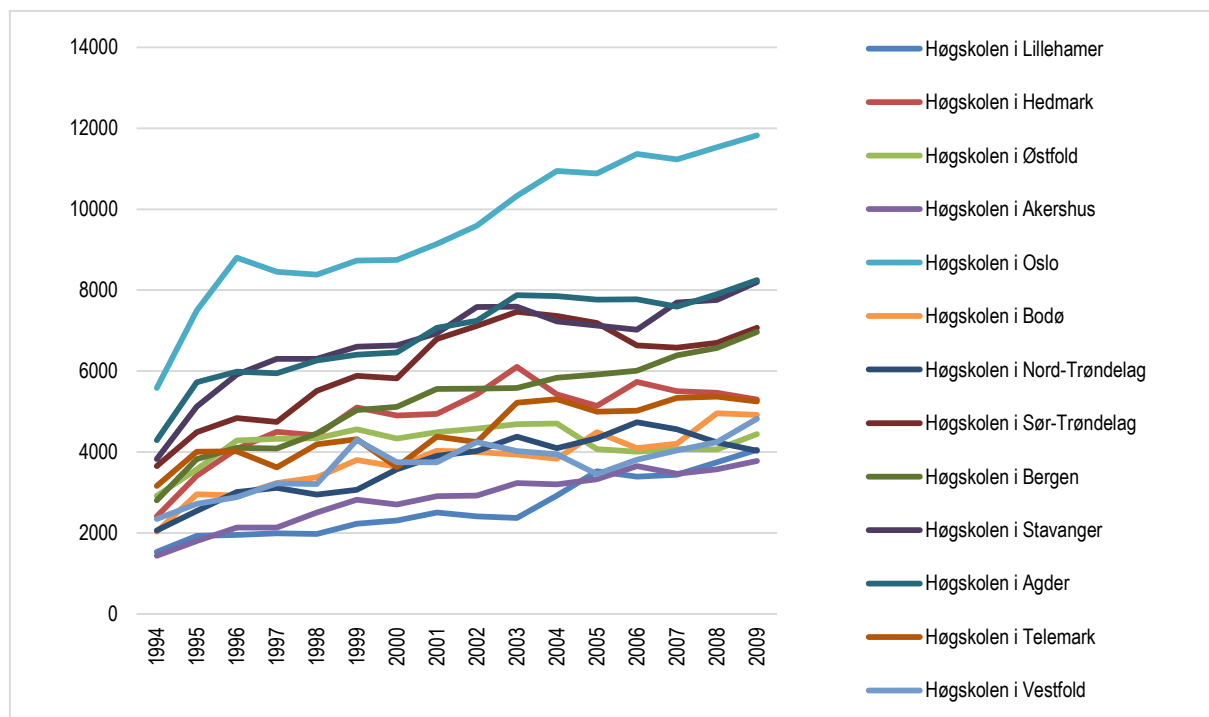


Figure 4.25b: Students by State colleges & new universities, 1994–2009. Numbers.

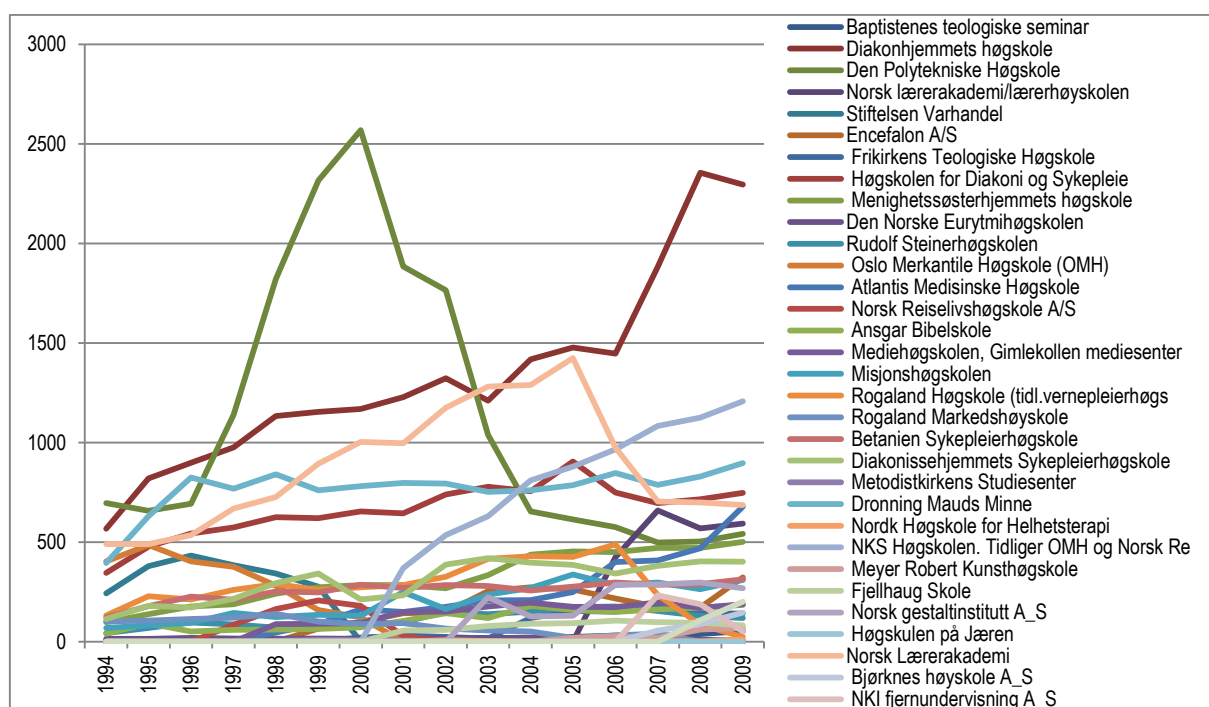


The university colleges and new universities are a group of institutions that vary in many respects, such as geographical location, what kind of education they offer, and as we can see, in size. They range from the smallest, with only a few students registered each year and no growth, the Sami University College, to the largest one, Oslo University College, which has more than doubled in

registered student numbers between 1994 and 2009. In 2011, Oslo University College merged with Akershus University College and became even bigger. This merger was partly a step towards obtaining University status, like Stavanger University College did in 2004, Agder University College in 2007 and Bodø University College in 2011. The size of the university colleges seems to correlate to the size of the city where their main campus is located, and behind Oslo we find the university colleges (or new universities) in Agder (Kristiansand), Stavanger, Sør-Trøndelag (Trondheim) and Bergen. The smallest ones (after the Sami University College) are in Nesna, Narvik, Harstad and Ålesund. The overall picture is one of growth, yet some have relatively stable student numbers. The growth was particularly rapid in the beginning of our observation period. In 2009, Tromsø University College, seems to lose all its students, due to their becoming part of the University of Tromsø that year.

Figure 4.26 shows the numerical development in the private higher educational institutions at the university college level. These institutions represent a quite small part of the total tertiary education system, and they are generally very small compared with the public institutions. This part of the sector thus is characterised by having a lot of very small institutions, and figure 4.26 illustrates this complexity.

Figure 4.26: Students by Private colleges, 1994–2009. Numbers.

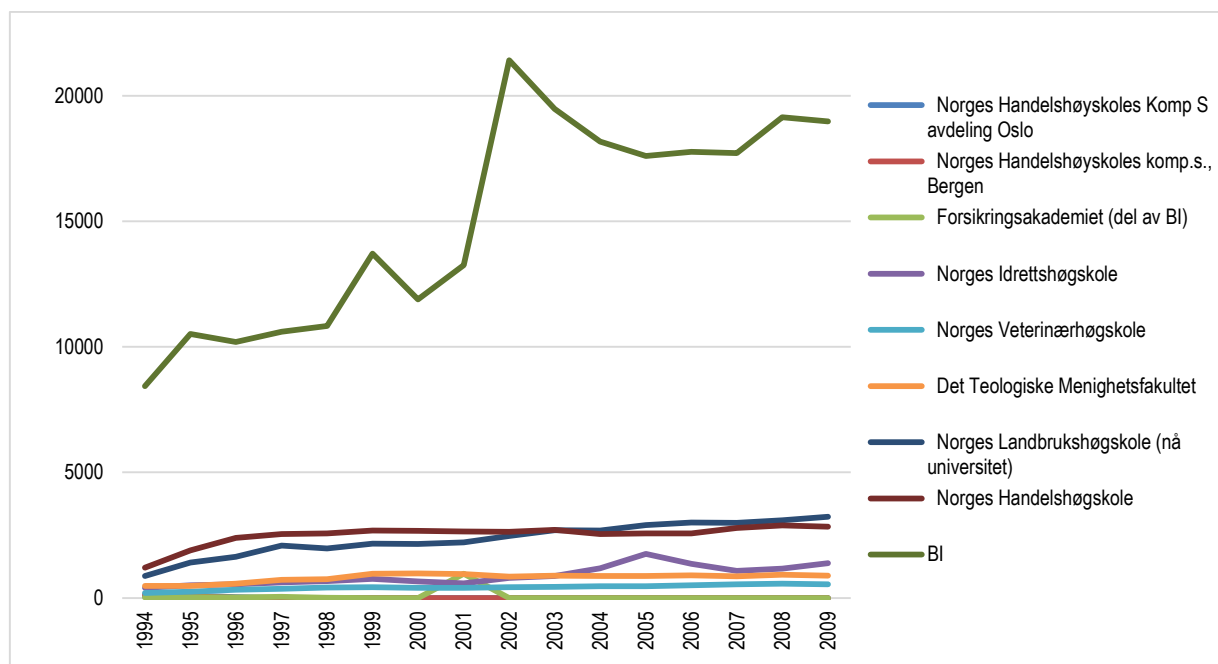


Register data from Statistics Norway, registered students by October 1.

As figures 4.22 and 4.23 showed, the private colleges had a small growth in registered students during the period summed up for all the institutions. Most of these are religious institutions. There is no overall trend for all the institutions. Most of these colleges are small in numbers, under 500 students registered each year. NKS (Norsk Korrespondanseskole, an old correspondence school) more than doubled its registered students from 2000 to 2009, most likely because they made education by internet a possibility around year 2000. One of the religious institutions, Diakonhjemmet University College (educating nurses primarily), had the steepest growth for the period. The Polytechnic college (“den Polytekniske høgskole”, which changed name to “Norwegian School of Information Technology” in 2002) had a steep growth from 1996 to 2000, followed by a steep fall in number of registered students. This trend matches the labour market; where IT-related jobs were plenty and growing in numbers from the mid 1990s to about 2000, followed by a period where this kind of jobs were harder to come by. This pattern is similar to the one we saw in the educational sub-field of computing in figure 4.18.

Figure 4.27 shows the development in the number of students in the scientific colleges, or specialised universities.

Figure 4.27: Students by Scientific colleges, 1994–2009. Numbers.

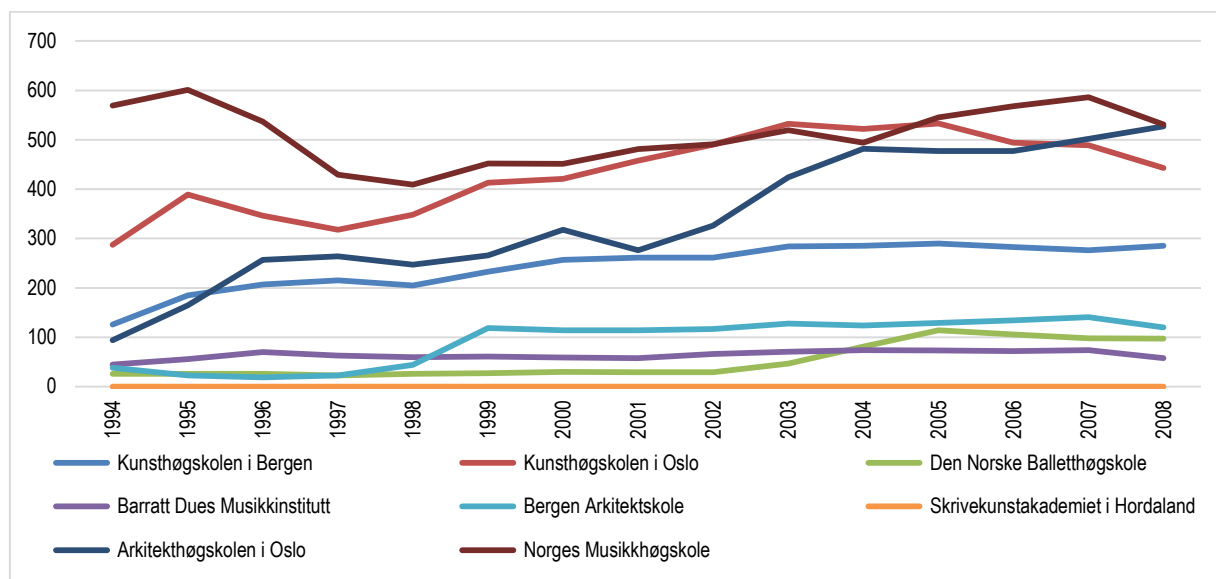


Register data from Statistics Norway, registered students by October 1.

The total number of students in the scientific colleges (or specialised universities) is quite small compared with the university colleges and the universities, as shown in figures 4.22 and 4.23. The decidedly biggest institution in this part of the sector is the private BI Norwegian Business School. Most of the growth in this part of the sector until 2002 is in fact due to the growth of this institution. The other institutions are comparatively smaller, and the biggest have approximately 3,000 students. The main trend is one of stability, with some growth for Norwegian School of Economics and Business Administration (in Bergen) and a slight growth for the Agricultural University of Norway. The latter gained university status in 2005. In 2014 it merged with The Norwegian School of Veterinary Science and became Norwegian University of Life Sciences (NMBU).

In figure 4.28, we show the development in student numbers for the aesthetic colleges.

Figure 4.28: Students by Aesthetic colleges, 1994–2009. Numbers.

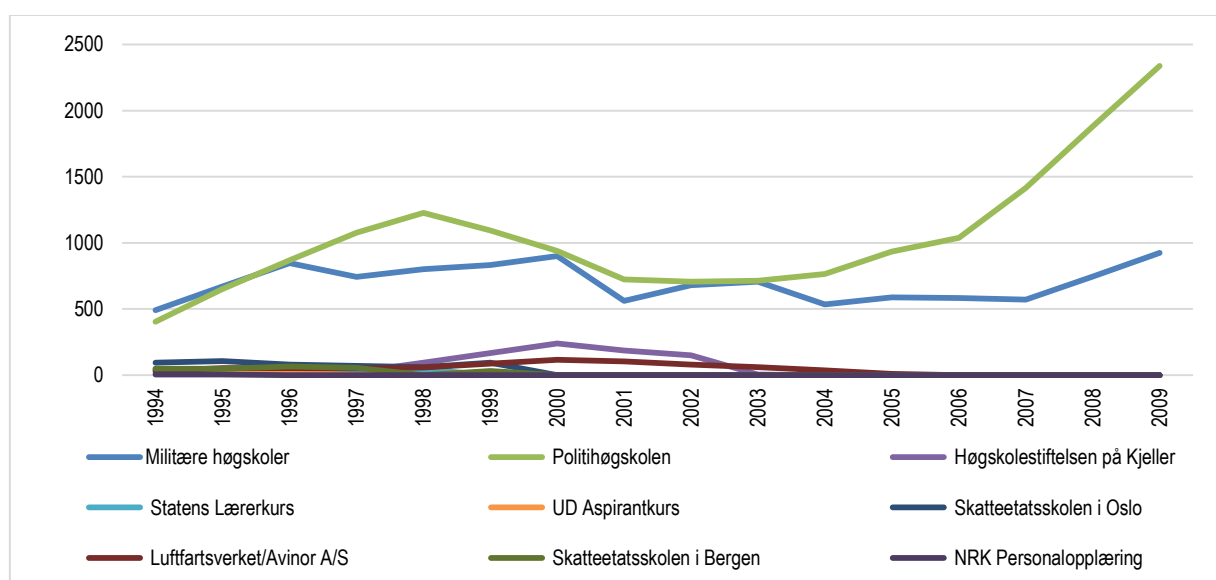


Register data from Statistics Norway, registered students by October 1.

The aesthetic colleges are a group of small institutions, which constitute a tiny fraction of the sector. Most of them are very difficult to get admission to, and are distinguished by their small number of students. Since the institutions are quite small, even a small change in registered students will be visible in the graphs. The Oslo School of Architecture and Design experienced a steady growth in student numbers from 1994 to 2004. In 2008, the number of students was more than five times higher than in 1994.

Figure 4.29 shows the development in the rest category of institutions, labelled “other”. This category mainly consists of educational institutions that train employees for different public agencies like the police, the military, the foreign office, the tax authorities and the air traffic control.

Figure 4.29: Students by Other, 1994–2009. Numbers.



Register data from Statistics Norway, registered students by October 1. The graph for students with unknown educational institution is not included.

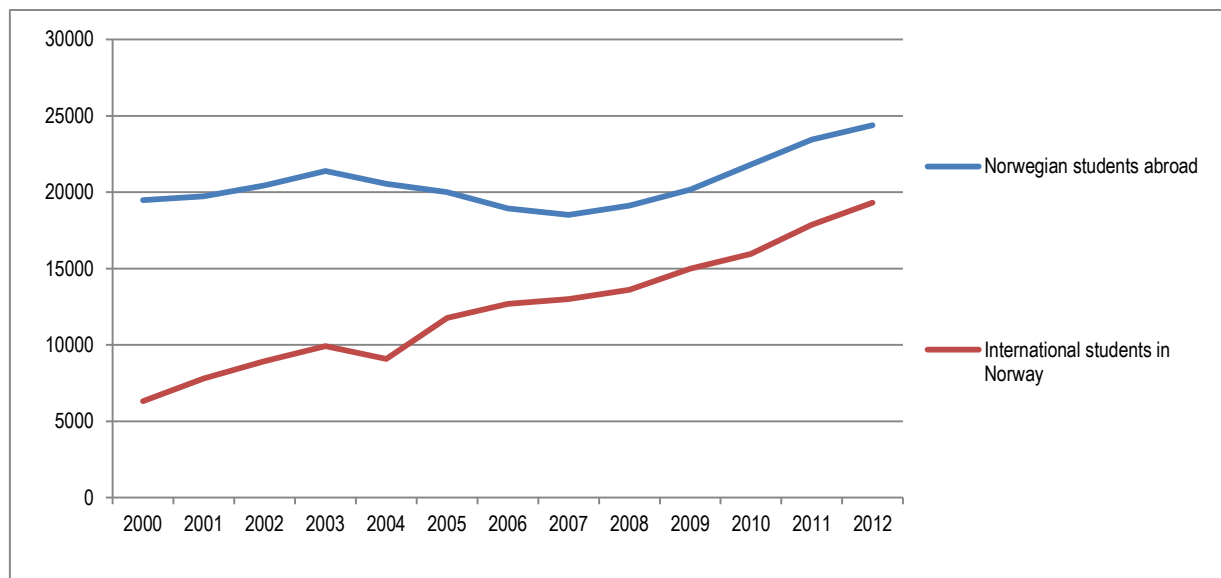
In figures 4.22 and 4.23, the “other” category included students registered in higher education, but with an unknown institution. This share dropped rapidly after 1995 due to better registrations. This graph is not included in figure 4.29. What we see is that the institutions are small in number of registered

students and quite stable. The Norwegian Police University College had growing student numbers from 1994 to 1998, followed by a small decline 1998 to 2003. The years from 2003 to 2009 were a new period of growth, especially strong in the later years.

4.7 Internationalisation

Norway has traditionally had a relatively high proportion of its student population abroad, with relatively few incoming students. Following the goals of the Bologna process, Norway has invested a significant amount of time and money to ensure that all students have the opportunity to gain experience from studying abroad (Kehm, Michelsen & Vabø, 2010). The proportion of the student population completing a full degree abroad has been approximately six to seven per cent in recent decades. During the last 15 years, the number of foreign students in Norway has grown as well, and has roughly tripled since the turn of the millennium and was estimated to more than 21,000 in 2013. Figure 4.30 shows the development in the number of Norwegian students abroad and the number of foreign students in Norway.

Figure 4.30: Norwegian students abroad and international students in Norway.



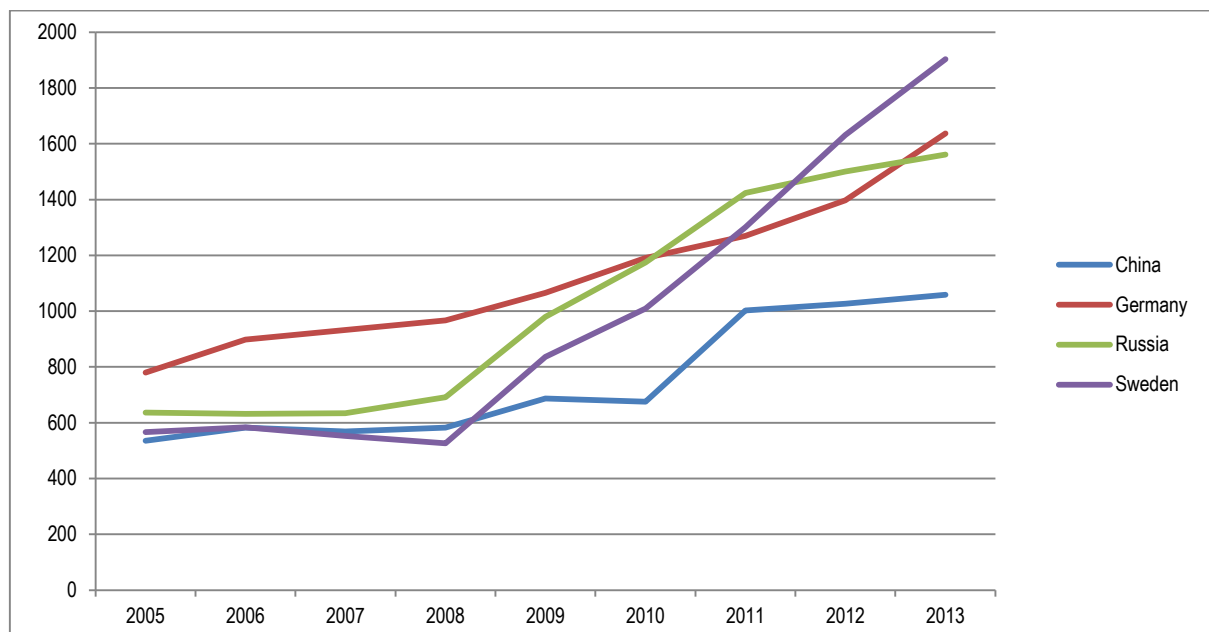
Source: Database for statistics on Higher Education and Norwegian state educational Loan Fund

The reasons for this development are probably numerous, and consist of both pull and push factors. In part, this growth is an intentional development, the result of policies to internationalise education. The creation of more courses taught in English and various scholarship schemes are examples of instruments of this policy. Changes in the funding of higher education have also contributed to the institutions' work to attract foreign students more actively than in the past. Most other European countries have introduced tuition fees for students from outside the European Economic Area, whereas in Norway education is still free. The growth is also related to migration patterns; a number of students with foreign citizenship have come to Norway for reasons other than enrolling in higher education, e.g. as refugees or because of worsening labour market opportunities in their country of origin.

Foreign students come from a wide range of countries. A large proportion of those who study in Norway participate in organised exchange programmes: for example, many European students enrol in an ERASMUS programme. There are also a number of bilateral agreements between Norwegian and foreign universities, as well as programmes aimed at students from developing countries and certain partner countries. The majority come from Europe, and a lot of them take part in shorter exchanges, while the majority of students from developing countries complete full degree programmes

in Norway. Figure 4.31 shows the numerical development of the four biggest groups of foreign students in Norway (Sweden, Russia, Germany and China).

Figure 4.31: Number of students from China, Germany, Russia and Sweden registered at Norwegian higher education institutions 2005-2013.



The figure shows a marked increase in all four groups after the international economic recession in 2008. Especially steep is the increase in the number of Swedish students. We find considerable variation among institutions in terms of the number and the proportion of foreign students. These reflect typical patterns of diversification as the largest universities have a high share of foreign students. The proportion is, however, highest at the relatively small art colleges and lowest at university colleges. Still, there are also a few examples of university colleges that have a high proportion of foreign students (e.g. Molde University College - Specialised University in Logistics). Most educational fields have a proportion of foreign students. Business administration programmes are most popular, and there has been rapid growth in the number of foreign students in this area over the last few years (Kyvik & Wiers-Jenssen, 2014).

4.8 Conclusions

The Norwegian system of higher education has gone through the same enormous growth since the end of the Second World War as other industrialised countries. The growth started somewhat later in Norway than in many comparable countries, and did not begin until the late 1950s. From 1960 the system experienced a rapid growth, and the number of students grew from 10,000 in 1960 to 40,000 in 1975. (Aamodt 1995: 64). The growth of the system in the 1960s was in the university sector. During the 1970s, the system of higher education also expanded through the number of institutions. From the 1970s, the growth was bigger in non-university institutions, and from 1975 most of the growth until 1987 came in this part of the sector. Then, towards the end of the 1980s there was again a considerable growth in the university sector and during the early 1990s there was a considerable growth in both types of institutions. In the period 1975 to 2009, we observe three different changes in the trends. In the first period, from 1975 to the mid-1980s there was an expansion, but not as steep as in the following period. From the late 1980s, there was a much more rapid growth, which lasted until the early 2000s. Then the growth flattened out before a new period of rapid growth in the most recent “post-finance crisis” years.

One aspect of this growth is the number of female students that overtook the number of male students during the 1980s. The number of female students grew faster than the number of male students, and passed the number of men during the 1980s. These changes in the sex composition of the student population may partly be related to the institutional composition of the sector. From the 1970s, the growth was bigger in non-university institutions, and from 1975 most of the growth until 1987 came in this part of the sector. The period in which the number of women exceeds the number of men, thus, is the period when the female dominated fields of study expand (like nursing, social work, pre-school teaching etc.). Female dominated institutions that earlier were regarded as upper secondary education were upgraded to the tertiary level. This includes schools for nurses, social educators, and radiographers. At the same time, the students in university colleges outnumber university students. The system of higher education is still remarkably gender segregated. Women are especially overrepresented in the university college education at bachelor level. Here we find professional educational qualifications for caring work in the welfare state such as nursing, pre-school teaching and social work. A growing population is on the other hand not an important part of the explanation. The growth in the numbers of students has been far greater than the growth in the population in particular (student typical) age groups.

In most educational fields, the number of students has increased during the observation period. However, we have also seen considerable differences between fields and subfields. In some fields, the growth has been strong and consistent, in other fields the number of students has declined, whereas in yet other fields the numbers have fluctuated. We have seen some obvious trends, such as an enormous growth in computing up until the burst of the dotcom bubble. We have also seen tremendous growth in Business administration and Health, whereas student numbers are declining in Agriculture, and in some engineering subfields like Mechanics and metalwork and Electronics and automation.

4.9 References

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5 Sweden

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5.1 Introduction

The Swedish higher education system is the largest among the Nordic countries and today contains more than 450,000 students, which makes it roughly double the size of the systems in Denmark, Norway and Finland. It is also the oldest system, with Uppsala University founded two years before the University of Copenhagen. One can also argue that the size to some extent creates different conditions from those of the other Nordic countries. The Swedish system has partly been more self-sufficient and for example less oriented by international trends (among the Nordic countries the Bologna process was implemented last in Sweden and arguably not as profoundly).

5.2 The policy context – four distinct different directions

The Swedish higher education system has been substantially reformed three times during the last 60 years: in 1977, 1993 and 2007. We will deal with these three reforms more in detail in other contexts, but for understanding the recruitment patterns, it is necessary to have some bearings on the major directions pointed out by the reforms. To summarise, very broadly, on these three reforms one can put three very different labels: *unification*, *marketisation* and *internationalisation*, which all have created distinctively different conditions for the educational offer to take shape. In addition, a number of commissions have been vital to the development of the sector. In order to understand the three reforms, it is necessary to add the commission of 1955, which prepared the ground for the extensive expansion of the system in the 1960s.

The commission appointed in 1955 was initiated to meet the rising demand for higher education that was already apparent in the 1950s and expected to rise with increasingly larger age cohorts of university age. The commission paved the way in two major parts for the extraordinary expansion of the enrolment in higher education that occurred during the 1960s. First, the financing of higher education in the faculty of philosophy, which had open access for the once eligible, was continuously tied to the enrolment of students. This principle, *universitetsautomatiken*, thus granted the universities financial conditions for growth. Second a new position was introduced, *universitetslektorer* (university lecturer), with teaching as its main task, which improved the opportunity for the seats of higher education to expand their permanent teaching staff to meet new demands. In addition to the 1955 commission, further initiatives were taken in the 1960s to facilitate the expansion, where the introduction of general study loans and an institutional expansion by the creation of branches of the

universities in new geographical locations and the establishment of a new university were the most important. (Askling, 2012:43–49)

The reform in 1977 was a result of a long process of commissions, most of which were appointed in the 1960s (UKAS, PUKAS and U68). The *universitetsautomatiken* had led to a very costly higher education, and the watchwords for the commission of the Swedish Higher Education Authority (UKAS) in 1966 were efficiency and throughput [*genomströmning*]. The answer to the problems was fixed study programmes, but with some room for local variation (HSV, 2006:10–11), and the introduction of a *numerus clausus* for all higher education. With regard to the number of students, one of the most important and lasting contribution of U68 and subsequent government bills was probably the delimitation and definition of higher education. Up until the 1977 reform, one spoke of universities and *högskolor* (college/university college). U68 suggested that from now on that some parts of the later years in the *gymnasium* (upper secondary school) could be regarded as part of higher education (SOU 1973:2: 9–10).

In 1989 a new Higher Education Commission was appointed, whose final report was a foundation for the 1993 reform. The Government bill proposing this reform was named “freedom for quality”. Regarding quality, it was a combination of previously observed and fear of future decline in quality of education and research that brought forth the proposed strategies in the bill. The enhanced quality was to be joined by an increased efficiency in resource management as well as increased mobility and innovation. To reach these targets a double strategy was to be utilised: the higher education institutions were to be given enhanced autonomy with regard to organisation of studies, the educational offer, student admissions, professor appointments, etc. This increased autonomy and institutional diversity were to be combined with incentives, evaluations and competition. The shape and orientation of the educational offer and the resource allocation should be determined by student choice (Prop. 1992/93:1: 21–22). The general direction of the reform could be described as creating market-like conditions in higher education (Bauer et al 1999: 85–88).

The latest reform regarding undergraduate studies in 2007, which can generally be described as the incorporation of a Bologna process degree structure (3+2+3, or 3-5-8 years) in the Swedish system, began to take shape in 2002. In the Government bill *Ny värld – ny högskola* [New world – new higher education] (2004/05:162) the most important watchword – the first in the statement of intent – was internationalisation, and all other proposals in the bill can be interpreted as ancillary to this general intention. For instance, the enhancement of quality is not only related to the benefit of those who get a better education, but also to the effect it will have on the attractiveness of Swedish higher education.

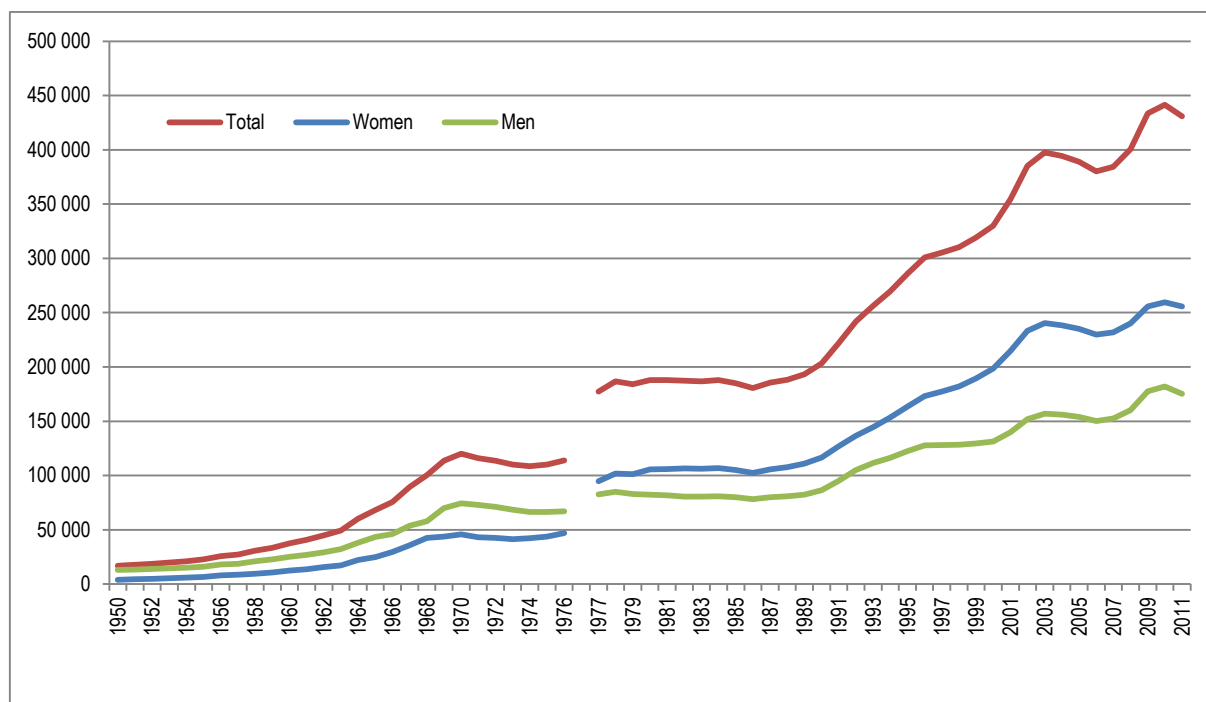
5.3 Expansion of the system

5.3.1 Expansion in absolute numbers of students, entrants and degrees

The Swedish system of higher education has followed the global trend of expansion of the number of students. The number of registered students has increased from 17,000 in 1950 to 431,000 in 2011 – a 2,500 per cent increase. The expansion has not been successive and it is possible to identify six phases. The 1950s form a first phase with a distinct and steady increase; from 17,000 to 37,000, implying more than a doubling in a decade and a yearly average growth rate of 8 per cent. A second phase is defined by the 1960s when an exceptional expansion occurred, raising the numbers from 37,000 to 120,000 in a decade, a tripling of the number of students and an annual average increase of 12 per cent. There are a number of factors that explain this extraordinary expansion (Börjesson 2011). Up until 1969, all who had received the *studentexamen* were entitled to enrol in any of the liberal arts faculties (humanities, social science, theology and law). The limitations in the number of places were to be found in some areas in the faculty of science, and at medical, technological and social institutes. The rise in the 1960s could to some extent be attributed to the extension in the number of places at the *gymnasiums* from which one could receive the *studentexamen*. Another important aspect, as noted above in the policy context, was the introduction in 1958 of the so called *automatik*, which

meant that the liberal arts faculties would be given teaching resources according to the number of students enrolled. A third important factor is demographic, as shown below.

Figure 5.1: Number of Registered Students, 1950–2011.



Sources: Figures for 1950 to 1976: Statistiska centralbyrån: *Statistisk årsbok*, the 1959–1979 editions; figures for 1977 to 2011, SCB www.scb.se.

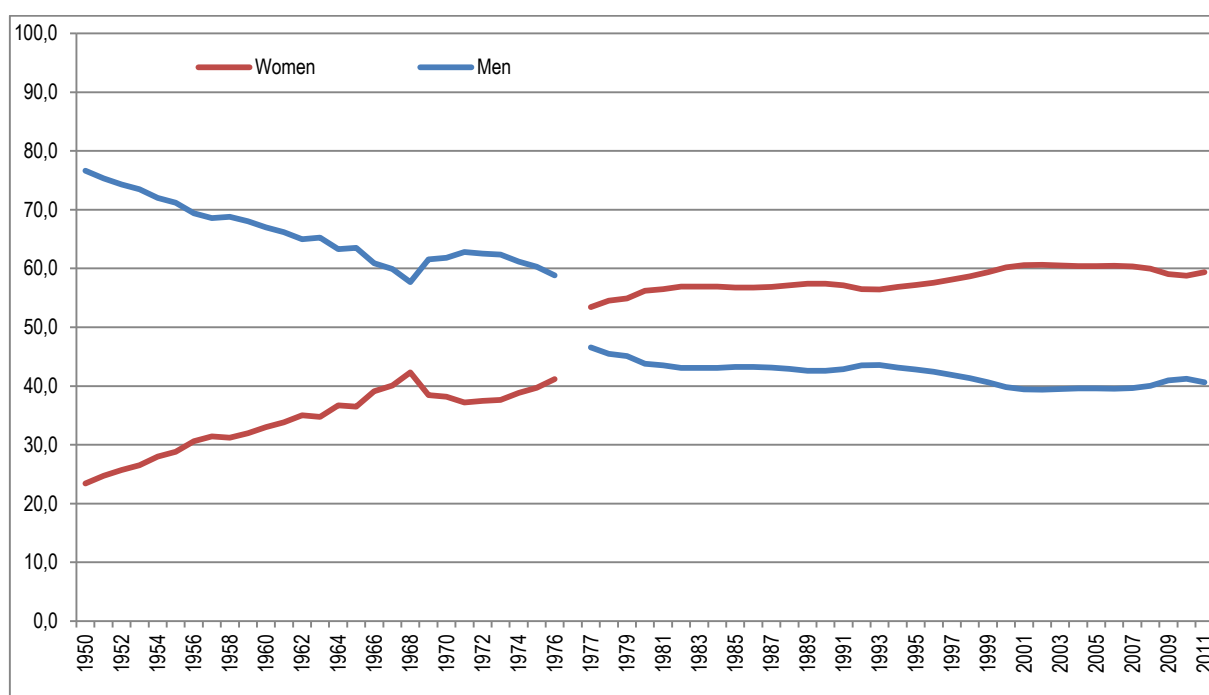
The subsequent period, phase three, covered the years from 1970 to 1976 and marked a rupture of the expansion, and even meant a decrease in the numbers, declining from 120,000 to 114,000, with a low of 109,000 in 1974. The jump in the figures from 1976 to 1977, going from 114,000 to 177,000, was a result of the changing definition of higher education that was one of the most important traits of the 1977 higher education reform. Former non-university degree programmes, such as those for nurses, pre-school teachers and teachers for lower grades in compulsory school, were over a night designated the status of higher education degree programmes. At the same time, measures had been taken to establish a framework for a dimensioning of higher education that would be more in accordance with labour market demands. And in 1979 the entire system became subjected to *numerus clausus*, with the government deciding on the number of places at each study programme. The trend of non-expansion from the previous period was carried over to the period 1977 to 1988 (phase four), when the numbers lay still around 185,000. First in the 1990s with a start in 1989, the numbers started climbing again and lasted to 2003 (forming the fifth phase). The expansion was not as extraordinary as in the 1960s but still important, going from 188,000 in 1988 to 398,000 in 2003, a more than doubling in 15 years and an annual growth rate of 5 per cent. The sixth period starts 2004 and ends 2011, the last year of available data, and is defined by a wave-like increasing pattern with peaks in 2003 (398,000) and in 2010 (441,000) and a bottom in 2006 (380,000).

One distinct feature of the expansion of the higher education system in Sweden is the growing number of women (see figure 5.1 above). In 1950 the share of women in universities and specialised institutions accounted for 23 per cent of the total number of students (see figure 5.2 below). From 1950 to 1968 there was a steady rise in the number of female students, increasing their shares from 23 to 42 per cent. As a result of the higher education reform in 1977, when former non-university degree programmes with a high proportion of women were given higher education status, the number of female students for the first time exceeded the number of men. The last 30 years have seen a more moderate development although characterised by a growing share of female students. From 1977 to

2011 the share of women increases from 53 to 59 per cent (with a high of 61 per cent in 2002). Subsequently, the share of men has decreased over the period, and shrunk from 77 per cent in 1950 to 58 per cent in 1968, and after the inclusion of many female-dominated programmes in 1977 from 47 per cent to just around 40 per cent from 1999 and onwards.

In addition we can notice some interesting differences in the curves of men and women participants in higher education. First, the expansion of the system in the 1950s and the 1960s rapidly closes the gap between men and women, but this trend is broken in 1968, after which men continue their expansion to 1970, while the curve flattens out for women. The expansion during the 1990s and early 2000s display a reverse pattern. At first men and women tend to increase at the same rate, but from 1996 men slow down their increase while women continue at the same pace. One plausible explanation is changes in the conditions of the different labour markets for men and women. The economic crisis in the 1990s was over faster for the male-dominated private sector and industry than for the female oriented public sector.

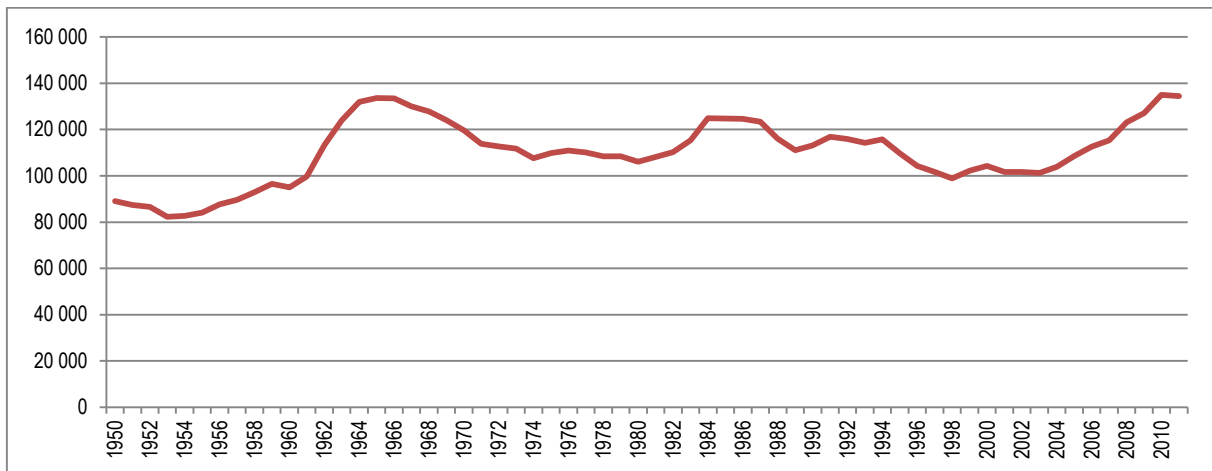
Figure 5.2: Share of women in higher education, registered students 1950–2011. Per cent.



Sources: Figures for 1950 to 1976: Statistiska centralbyrån: *Statistisk årsbok*, the 1959–1979 editions; figures for 1977 to 2011, SCB www.scb.se.

The expansion of the number of students enrolled in higher education is greater than the general growth of the population, implying that the growth of the system is based on an increasing share of a birth cohort starting tertiary education. In fact, the relation between the overall size of the youth population, here indicated by the number of 20 year olds, and the number of students is rather complex. While the curve of higher education students is growing steadily, although at an uneven rate, the number of 20 year old is strikingly stable for a long period of the last half century. Between 1970 and 1995, the number oscillates around 115,000. The preceding 20 year period is however more drastic, containing the lowest point over the whole period, 82,000 in 1953, as well as one of the highest, 134,000 in 1965. The number thus increased by 62 per cent in 12 years. After the peak in the mid-1960s, the numbers declined steadily for almost ten years, though not to the low levels of the 1950s. The last decade is also more extreme, with continuous growth from 2003 to 2010.

Figure 5.3: Number of 20 year olds, 1950–2011.

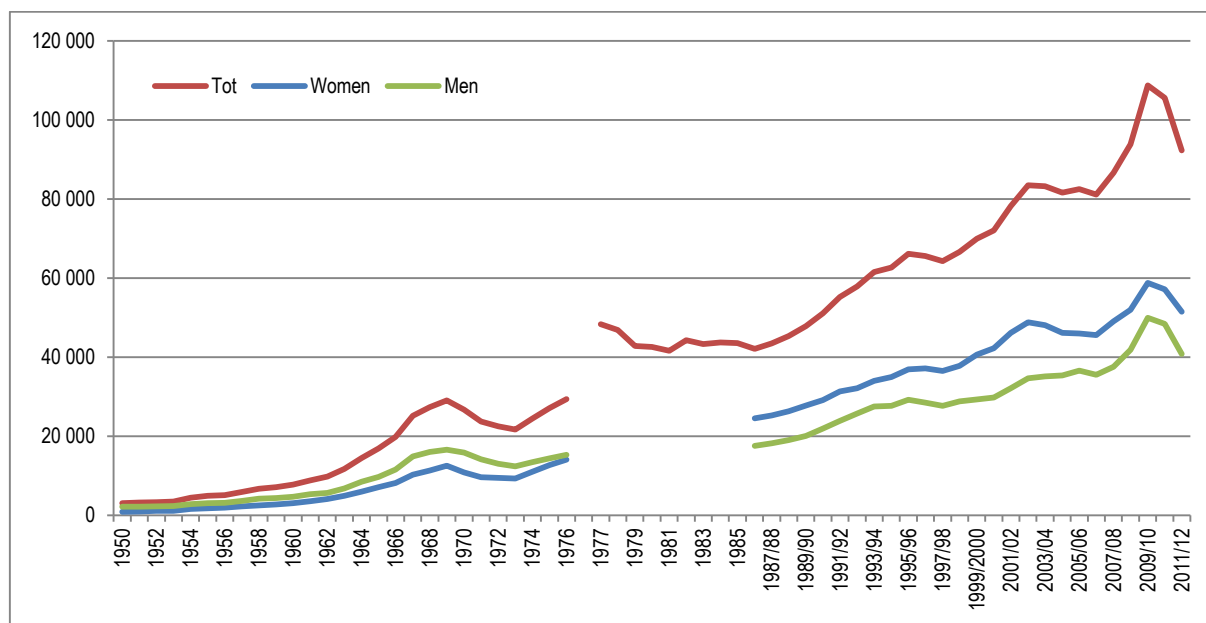


Source: Statistics Sweden: The Swedish population by age classes, 1860–2012.

When analysing the two curves in detail, it becomes obvious that the two major periods of expansion of higher education in Sweden are based on contrasting demographic conditions. The first expansion, in the 1960s, was driven by an extensive growth of the young population, from the 1950s to the mid-1960s; the curve also stabilises and goes down with the declining number of 20 year olds. The second important expansion, in the 1990s, coincided with a decline of the young population. The number of 20 year olds did fall almost steadily from 125,000 in 1986 to 101,000 in 2003. The subsequent growth in the young population, from 2003 and onwards, translates into an oscillating growth of the number of students.

Yet another way to analyse the growth of the higher education system is to focus on the entrants. For the first two phases of expansion during the 1950s and the 1960s the curves of the overall number of students and of entrants follow each other. There is a steady increase of entrants during the 1950s and a more rapid growth during the 1960s, up until 1969. Thereafter the decrease between 1969 and 1973 is more emphasised for the entrants than for the overall number of students. This is also true for the recovery between 1975 and 1977. The stagnation during the 1980s in the overall number of students corresponds well with a stable level of entrants, just above 40,000 for 1979 to 1987. The drastic expansion in the 1990s starts with a somewhat earlier increase in the number entrants, rising from 1986/87, but is generally matched by an increase up until 2003 with a small decrease from 1995 to 1997.

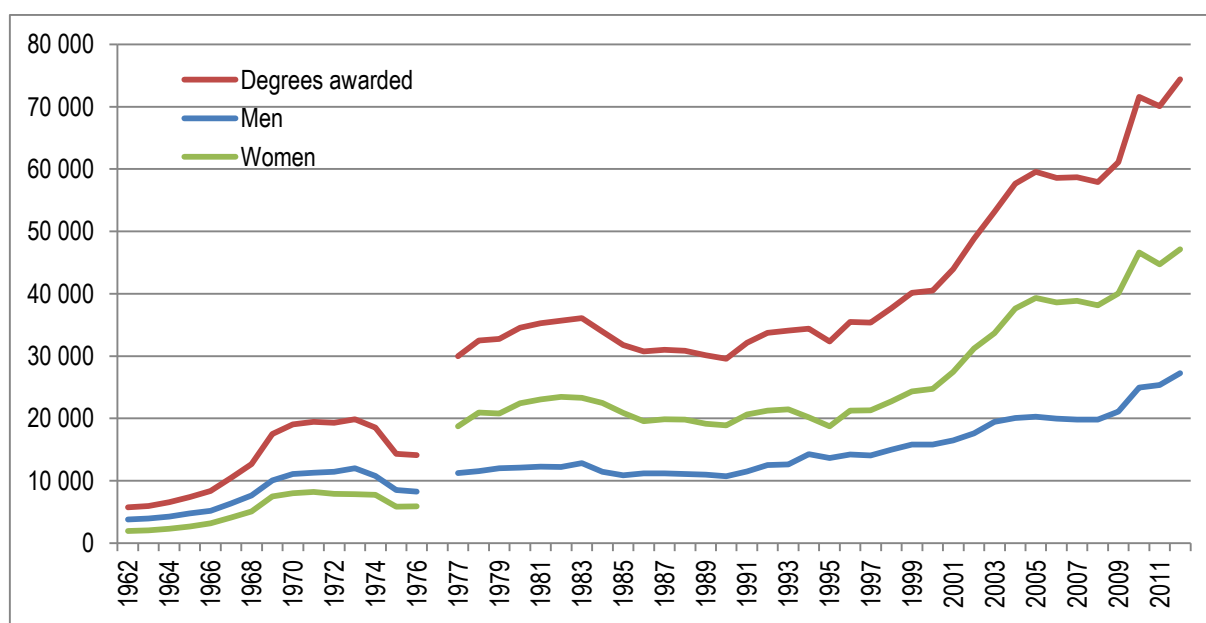
Figure 5.4: Number of entrants, men and women, 1950–2011.



Sources: Figures for 1950 to 1976: Statistiska centralbyrån: *Statistisk årsbok*, the 1959–1979 editions; figures for 1977 to 2011, SCB www.scb.se.

The number of female entrants in general seems to follow the pattern of the general expansion. Although, during the period from 1950 to 1976 the women increased their proportion of the total number of entrants from 29 per cent to 48 per cent. This means that counting the number of entrants almost levels the differences between men and women even before the 1977 higher education reform. From 1977 and onwards the women then make up a clear majority of the entrants to higher education but there are still some fluctuations worth noting. The share of female entrants increased during the period from 1992 (56 per cent) to 2001 (59 per cent) but then decreased to a low in 2009 (54 per cent).

Figure 5.5: Number of degrees awarded, men and women, 1962–2011.

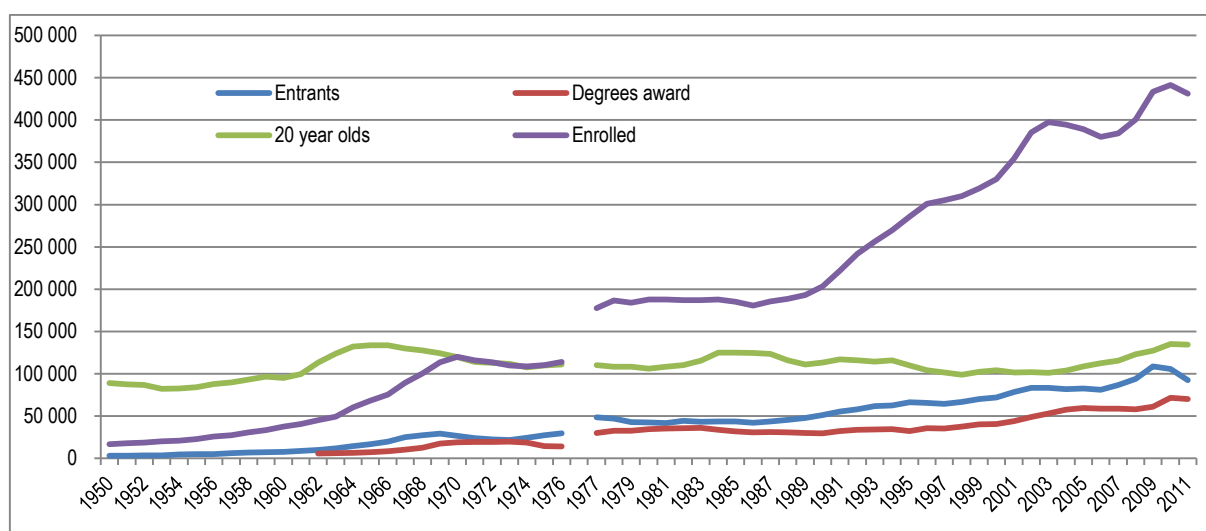


Sources: Individual based data from Statistics Sweden.

Finally, the expansion of the higher education system can also be measured by the number of degrees awarded. Available data indicate that the number of degrees tends to follow the number of entrants and of the overall number of students, but with a certain time lag. There is a steady increase in the number of degrees up until 1969 but the drop does not occur until after 1974. Also the increase in the 1990s is not visible in the statistics on degrees until from the mid 1990s. It is also noteworthy that the number of degrees was rather stable for more than two decades; from 1977 to 1999, the number was about 30,000 to 40,000. Thereafter the number almost doubled in a decade.

In figure 5.6 the differences between men and women is further highlighted. From the beginning of 1980 and up to 1994 the number of exams by women shows a small decrease while the men with exams increase somewhat. This trend is broken in the mid 1990's as a result of the increasing proportion of female students in higher education. The period from 2000 and onward shows some interesting patterns. The distinct increase in number of degrees during this period can mainly be traced to an increasing number of women with degrees, which has created growing differences between men and women.

Figure 5.6: Number of 20 year olds, enrolled students, entrants, and degrees awarded, 1950–2011.



The figure sums up data from the previous figures.

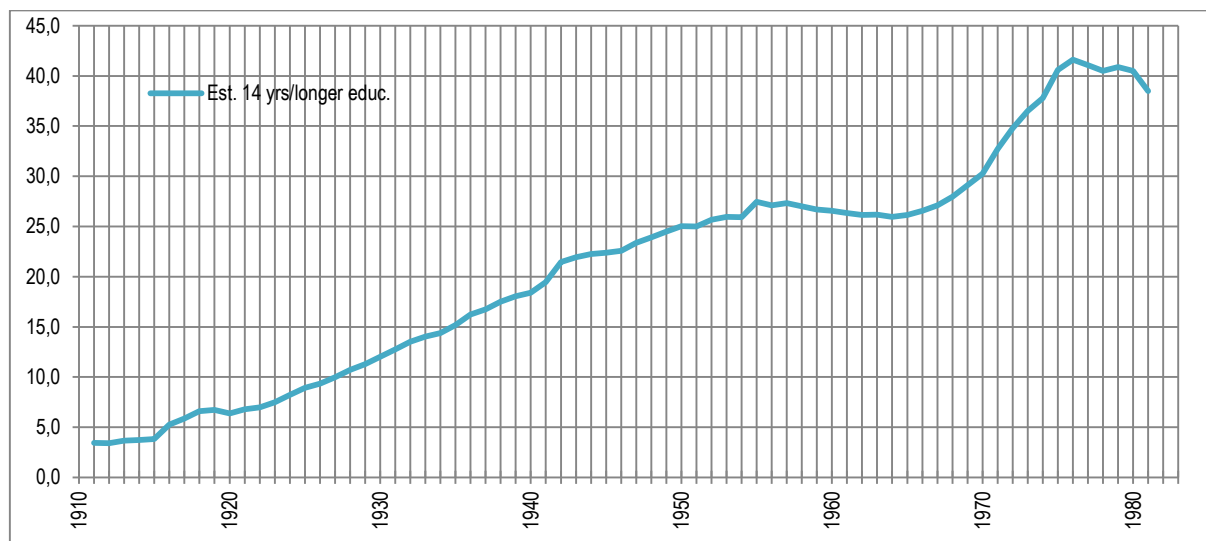
When the different indicators of the growth are related to each other and to the number of 20 year olds a number of conclusions can be drawn. A first obvious conclusion is that there is a general relation between entrants, enrolment and degrees. When the number of entrants rises, also the numbers of enrolled and degrees increase. However, at a more fine-tuned level, we notice that there is a growing gap between entrants and degrees from the 1990s and onwards. When relating the figures of expansion to the number of twenty-years old, one conclusion is that there seems to be a direct relation between size of the young population and the number of students for the first half of the demi-century, but that this relation becomes much more complex in the latter half, where the expansion is driven primarily by other factors, such as a more extensive recruitment from social groups who have been less inclined to pursue higher education, and from international students. Furthermore, the student population tends to become more diversified according to age, which weakens the link between the size of the young population and the size of the student population. This indicates that in order to understand the expansion of higher education and the development of the system it is necessary to study more closely the characteristics of the student population and the transformation of the composition of the group over time.

5.3.2 Share of an age cohort

A cohort analysis of the rates of admission to higher education provides another measure of the overall expansion of the system than the sheer numbers. The admission rates give an account of the relationship between the increase in numbers of students and the size of the cohort. It thus better estimates the situation of competition within each cohort and the value of a higher education degree for different cohorts.

An estimate of the admission rates in the long run, based on the number of years of education for each cohort from 1911 to 1981, covers basically the whole post-war period, which we have analysed above according to number of students enrolled and degrees obtained. The diagram shows that the remarkable expansion of higher education translated into clearly increased admission rates. In comparison with the overall expansion, the admission rates are steadier in their increase for the first forty years. From 1915 to 1955 there is a continuing increase from 5 per cent to 25 per cent. The augmentation was in fact most dramatic for the oldest cohorts; between 1915 and 1925 the percentage was doubled (from 5 to 10 per cent), while it took yet another 15 years to double the percentage once more up to 20 per cent, which was reached just after 1940. For the latter period of steady increase of the cohorts' attendance, 1940 to 1955, the increase did slow down further, rising about 7 per cent in 15 years. The latter cohorts were the ones that formed the basis for the extraordinary expansion in the 1960s. That the rates for these cohorts were not rising more rapidly is explained by the fact that the cohorts also expanded in size, which to some extent levelled out the effect of the expansion of the enrolment. After this 40 year long period of increasing rates, the first decrease can be noticed. From 1955 to 1964, the rates dropped from 28 per cent to 26 per cent. This corresponds to the stagnation in numbers of students enrolled in the 1980s. The development for the cohorts of 1965–1974 stands in sharp contrast to the stagnation for the preceding cohorts: a yearly level of two percentages increase is noticed, raising the level from just over 25 per cent to well over 40 per cent in less than a decade.

Figure 5.7: Estimated share of each cohort with 14 years or more of education (primary + secondary + tertiary), birth cohorts 1911–1981. Per cent.



Source: Based on data from Melldahl (forthcoming).

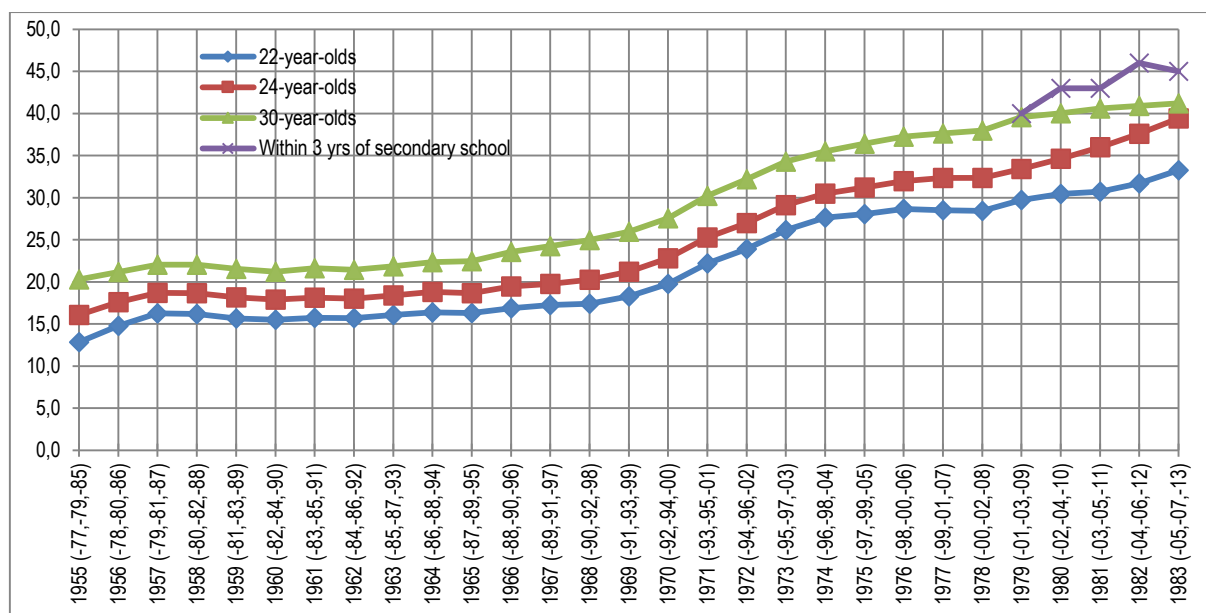
The cohort data shed new light on the expansion of higher education, as depicted from the overall enrolment. The various conditions for the two large waves of expansion (the demographic driven one of the 1960s and the economic driven one of the 1990s) spell out clearly differently in the cohort data. In fact, the expansion of the 1960s becomes the tail of a relatively long period of steady increase in the rate of enrolment, while the growth in the 1990s stands in sharp contrast to the stagnation period

of the preceding cohorts and forms the steepest expansion phase of the post-war period. This has clear implication for the competition between and within cohorts.

Breaking down the share of a cohort that has commenced higher education at different ages provides data for more precise analysis of the expansion of higher education during the 1990s. The rates were fairly stable for different ages (22, 24, and 30 year olds) of the cohorts born in 1957–1965, who became 20 years old between 1977 and 1985, a period with little overall growth of the system. From the 1966 cohort to the 1974 cohort there is a relatively sharp increase in rates of access, corresponding to years of entry in the late 1980s to the mid-1990s, a period with rapid increase. This increase is interestingly evenly distributed; the older tend to increase their share at the same rate as the younger ones. Then the curve levels out somewhat before it begins to rise again for the 1979 cohort and on. The rising curves for the 22 year olds and the 24 year olds also indicate that the fluctuation of the overall number of students, with a decrease from 2003 to 2006, is not related to a lowering entrance rate for the younger cohorts.

For the 1979 cohort, we can add the official data of transition rates between secondary school and higher education, which obviously is a bit higher than for the rest of the cohort. It highlights the fact that there is a quite substantial proportion in each age cohort (for example 10 per cent of 30 year olds in 2011) who do not have access to the most important prerequisite for entering higher education – a diploma from the upper secondary school.

Figure 5.8: Share of each cohort in higher education at given moments, birth cohorts 1955–1983. Per cent.

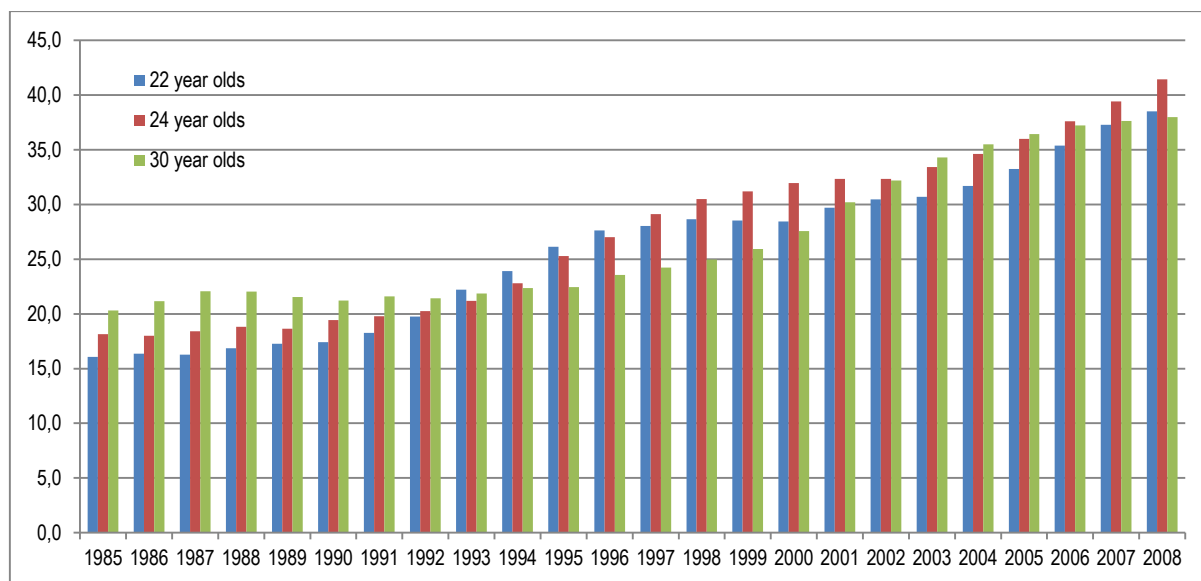


Finally, we would like to highlight a phenomenon that appears in times of rapid expansion of the rate of entrance to higher education. The data underlying the figure above can be presented in a different fashion where the rates of attendance for the three selected age cohorts are shown for each academic year, as shown in the figure below. By analysing the figures in such fashion, it becomes clear that the normal order, that is, that the older cohorts tend to have a higher share of higher education attendance than the younger once at any given moment (see for example the years 1985 to 1991 below), does not have to apply in times of rapid expansion. For 1992 the gap between the age classes has decreased and is marginal. From 1993 to 1996 the youngest group has the highest rate, almost 5 percentage points higher than the oldest group in 1996. Between 1997 and 2001 a new pattern emerges when the second youngest group, the 24 year olds, has the highest rates, with more than 6 percentage points difference from the oldest group in 1998. In the 2000s, the relations between the

age groups become more ordinary again, but however with not such distinct differences as in the late 1980s.

What the diagram neatly shows is that a sharp expansion of the educational system can drastically change the competition situation at the labour market for different cohorts. The given advantage of older cohorts, that they tend to be more educated than younger ones, disappeared in the fast augmentation of the enrolment in the middle of the 1990s. For those entering and re-entering the labour market when the economic tide changed in the late 1990s, the younger cohorts were clearly better equipped with educational credentials than the older cohorts.

Figure 5.9: Share of cohort for 22 year olds, 24 year olds, and 30 year olds having attended higher education, 1985–2008. Per cent.



5.3.3 Conclusions

This section has demonstrated the extraordinary growth of the higher education system in Sweden in the post-war period. By analysing the number of students, entrants, exams and shares of age cohorts enrolled in higher education a number of different trends can be observed. Firstly, two major phases of rapid expansion are identified, the 1960s and the 1990s, driven by different logics. The 1960s expansion was mainly driven by an extensive growth of the youth population (measured by the number of 20-year-olds) while the 1990s expansion coincided with a decline in the youth population. The shares of an age cohort entering higher education have had a steady increase over the period from the 1950s to 1970s, a stagnation during the 1980s and a very rapid increase in the 1990s. One important aspect of the growth is the increasing numbers of female students visible in both phases of the expansion. The proportion of women exceeded the proportion of men in the late 1970s – partly as a result of the incorporation of female dominated programmes in the higher education system 1977 – and has increased over time. The expansion will now be studied more in detail focusing first on the type and level of studies.

5.4 Type and level of studies

5.4.1 Type of studies

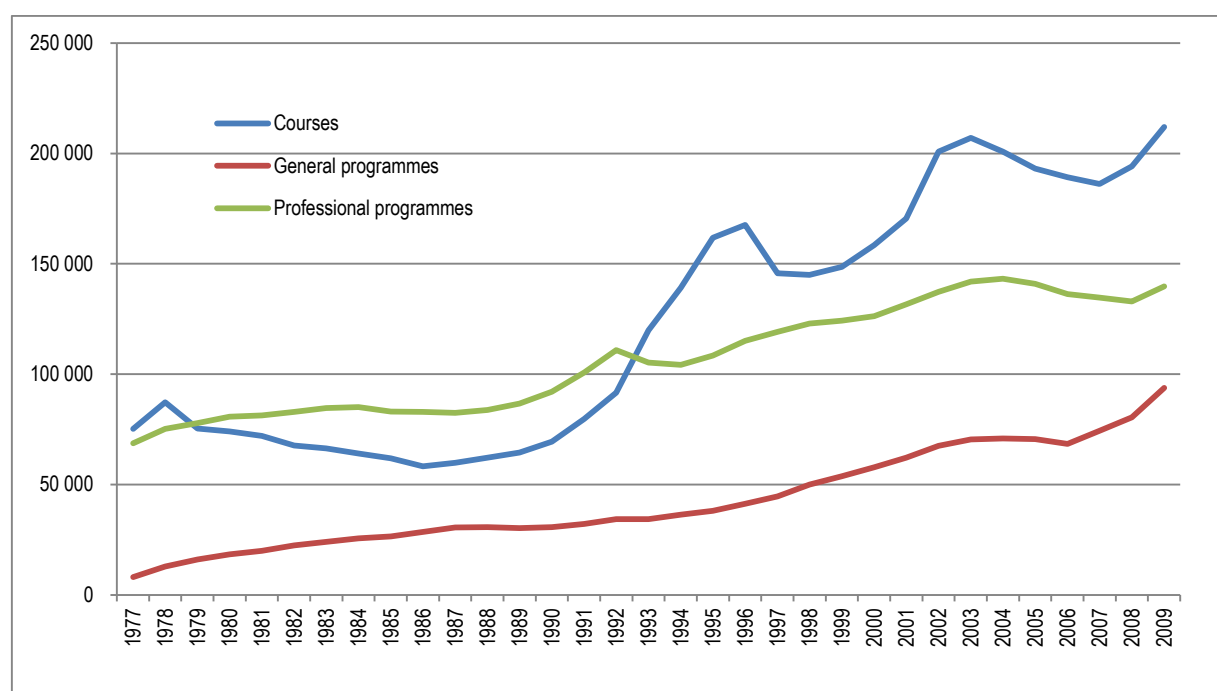
In the Swedish system of higher education, three major types of higher education can be distinguished: courses, professional programmes and general programmes. Courses range from a few credits to one or two semesters. When a certain number of course credits is reached, fulfilling specific diploma requirements for a general diploma, predominantly a *filosofie kandidat*-degree (bachelor's

degree) or a *filosofie magister*-degree (master's degree), can be issued. Professional programmes are regulated by specific degree requirements and lead to a specific professional degree implying a relatively strong regulatory framework regarding the content of the programmes. In addition, most of the programmes have been subject to *numerus clausus* and in some cases specific admission standards. They also often comprise some kind of professional training. General programmes differ in several aspects from the professional programmes. They are not as strictly regulated as the professional programmes, neither by degree requirements nor by content specifications or admission criteria, and are not subject to *numerus clausus*. Furthermore, work placement is seldom included in the programmes.

During the first decade of the 30 year period analysed there was a small annual rise in the number of students enrolled in professional programmes, increasing from around 70,000 in 1977 to over 90,000 in 1990, and a larger growth of students enrolled in general programmes, going from 10,000 to 30,000 for the same years. At the same time, students taking courses decreased in numbers, from 75,000 in the late 1970s (as high as 87,000 in 1978) to below 60,000 in 1986 and 1987. This implies that the general relationship between the three types of education has changed profoundly. While professional programmes and courses were equal in size in 1977 (around 45 and 50 per cent each) and clearly dominating over general programmes, which had a minor size (5 to 10 per cent), ten years later the professional programmes were distinctively larger than courses (almost 50 per cent of all students versus 35 per cent) and the general programmes had narrowed the gap (constituting 17 per cent).

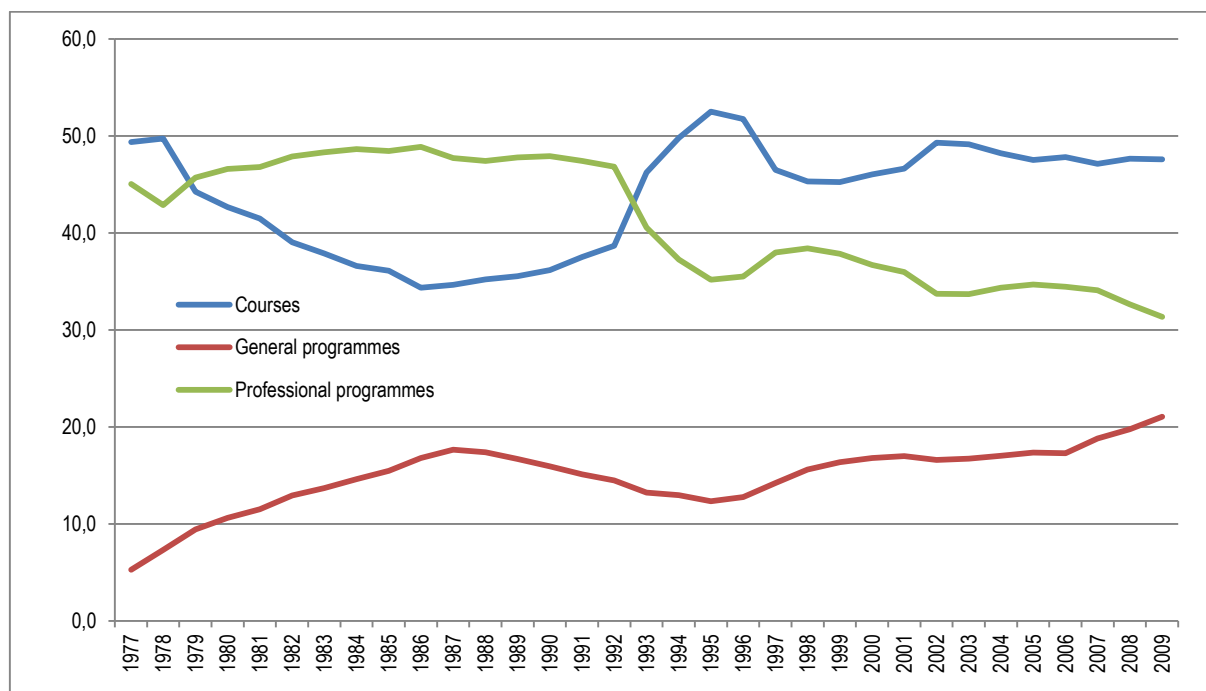
During the 1990s there is a rapid increase in the number of students registered on courses, growing from 70,000 in 1990 to more than 200,000 in 2001. The increase is however not steady, but more wavelike. There is a peak in 1995 and 1996 at almost 170,000 and a fall back to below 150,000 in 1997 to 1999 before the number increases rapidly again. The two types of programme increase steadily during the 1990s and the first years of the 2000s, where the professional programmes grow from just over 90,000 1990 to over 140,000 in 2003, and the general programmes from 30,000 to 70,000 during the same period. After 2003 the professional programmes levelled out at around 130,000 to 140,000, while the general programmes started to grow after 2007, increasing from below 70,000 in 2006 to over 90,000 in 2009.

Figure 5.10: Students by type of studies, 1977–2009. Numbers.



Sources: Individual based data from Statistics Sweden.

Figure 5.11: Students by type of studies, 1977–2009. Shares in per cent.



Sources: Individual based data from Statistics Sweden.

Setting the numbers in relation to the overall expansion of higher education enrolment, the higher education reforms and the economic development, we can first notice that the stable period of the 1980s in fact meant a re-composition of the types of studies, with an increase of programmes and a relative decreasing importance of courses. Second, the vast expansion of the 1990s was an effect of a moderate and steady increase of the number of students attending programmes of both types, combined with a very rapid growth of students enrolled in courses. The latter must be understood in relation to the labour market. At times of high unemployment, as in the first half of the 1990s, courses offer a flexible alternative to unemployment since they only involve a commitment over a restricted period of time and often admission is easier than for programmes. Courses can also function as means of enhancing one's position in labour market by supplementing an existing degree. Third, the reforms of both 1993 and 2007 are related to the structure of the educational offer. The expansion of the 1990s is to some extent conditioned by changes in the financing system, where the higher education institutions were funded on the basis of both enrolment and of productivity, and not of enrolment alone. It seems likely that the higher education institutions followed a strategy of admitting larger numbers of students in order to be able to fulfil the productivity quotas.¹¹ The 2007 reform, with the introduction of the Bologna system in Sweden, had the effect of increasing general programmes over professional programmes because the reclassification of certain programmes from professional to general.¹²

5.4.2 Level of studies

Sweden probably had the most complex system of levels of study, with, on the one hand, general degrees of bachelor's (3 years), and master's (4 years), and, on the other hand, a variety of

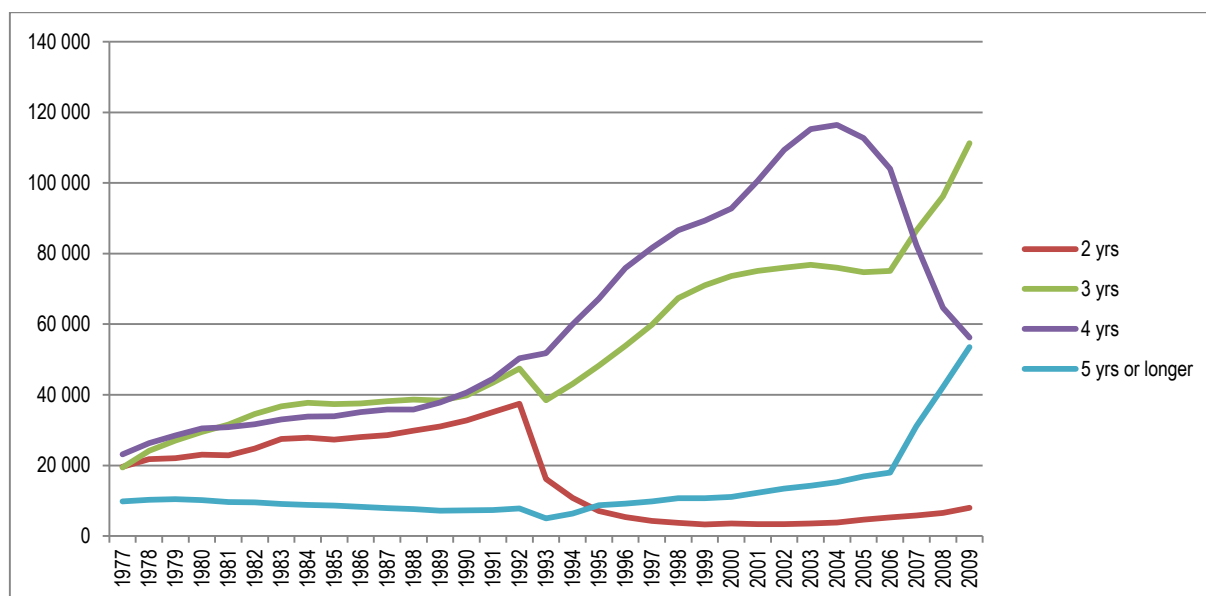
¹¹ One can also add that the institutions were able to save surplus production for forthcoming years. This meant that during the first years of the 1990s with its increasing numbers of applications, the institutions could create buffers for less productive years in the future by rapidly increasing the enrolment.

¹² In comparison with the courses, the two types of programme have a more stable development due mostly to two reasons. First, for most of the professional programmes the number of student places is fixed. Second, the numbers of students include all registered students and the entrants are thus counted together with those already in the programme, implying that an increase in the intake will have full effect first after four or five years depending on the length of the programme.

professional degrees ranging from 2 years to 5.5 years (including in between 2.5, 3, 3.5, 4, 4.5 and 5 years degrees). In 2007, this system was adapted to the Bologna framework of 3+2 years educational degrees, a process that has been cumbersome in some respects.

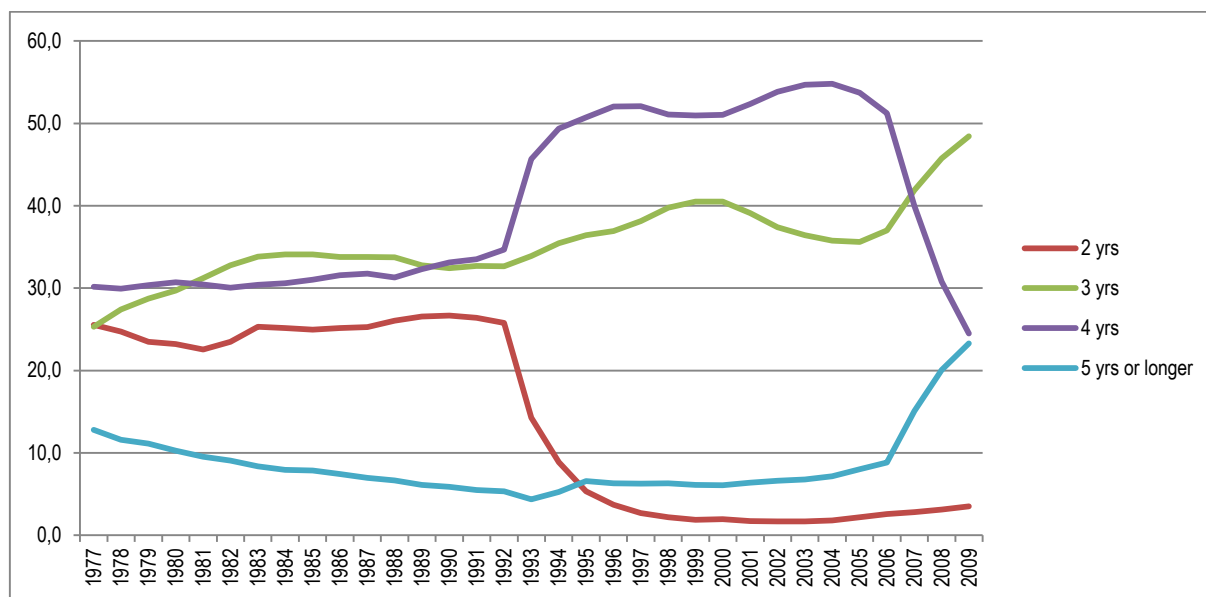
Studying the development of enrolment by level, or more precisely, the length of the programmes attended, there was until 1992 a general increase in students enrolled in programmes of two, three and four years in length, and they were fairly similar in relative size over the period. At the same time, the longest programmes, the five year and more, with the by far smallest number of students, decreased steadily. In 1993 a new degree structure was introduced, granting higher education institutions greater opportunity to design their educational offer. With the change of the degree structure, a number of two year programmes were upgraded to three year programmes, and some three year programmes became four year programmes. Consequently, in the following years up until 2006 the popularity of the two year programmes, equivalent to the British Foundation degree or the American Associate's degree, decreased. The three year programmes, *kandidat* (bachelor's), and particularly the four year programmes, *magister* (one year master's), made a remarkable increase in number of students, accounting for more than 50 per cent of the programme students. The introduction of the new degree structure in 1993 changed the programme landscape from being dominated by three lengths, two, three and four year programmes, to a structure dominated by two lengths, three and four year programmes. In 2007, when Sweden introduced the three cycle qualification framework, the popularity of the four year *magister* programmes drastically decreased and students instead chose three year or five year programmes. Thus there has been continuity in that the programme structure since 1993 has been divided in two lengths, but before 2007 the gap was one year, and after 2007 it is two years.

Figure 5.12: Students by level of studies, 1977–2009. Numbers.



Sources: Individual based data from Statistics Sweden.

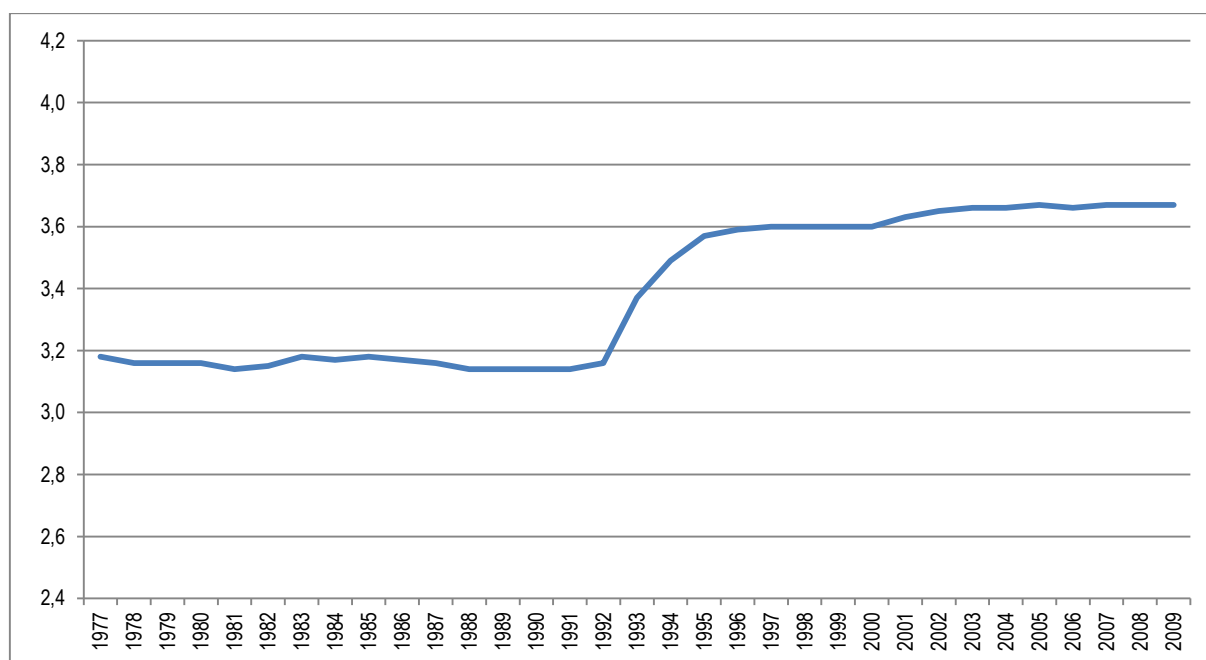
Figure 5.13: Students by level of studies, 1977–2009. Shares in per cent.



Sources: Individual based data from Statistics Sweden.

By calculating the average number of years for students enrolled in programmes (both general and professional) it becomes clear that the 1993 reform meant a sharp increase in the average length of the programmes attended, rising from just below 3.2 years for the whole period from 1977 to 1992, to 3.6 years from 1995 to 2000 and thereafter a further increase to almost 3.7 years from 2003 and onwards. The length of the programmes has implications for the number of students enrolled in higher education at any given time. The extreme expansion of the number of students in the 1990s is to some extent a result of the reform in 1993, with its increase of almost half a year of the medium length of the programmes the students attend. When students stay longer in the system at the same time as more and more students are being enrolled we witness a dramatic expansion.

Figure 5.14: Medium length of programmes attended, 1977–2009. Years.



Sources: Individual based data from Statistics Sweden.

5.5 Fields of study

5.5.1 A general overview

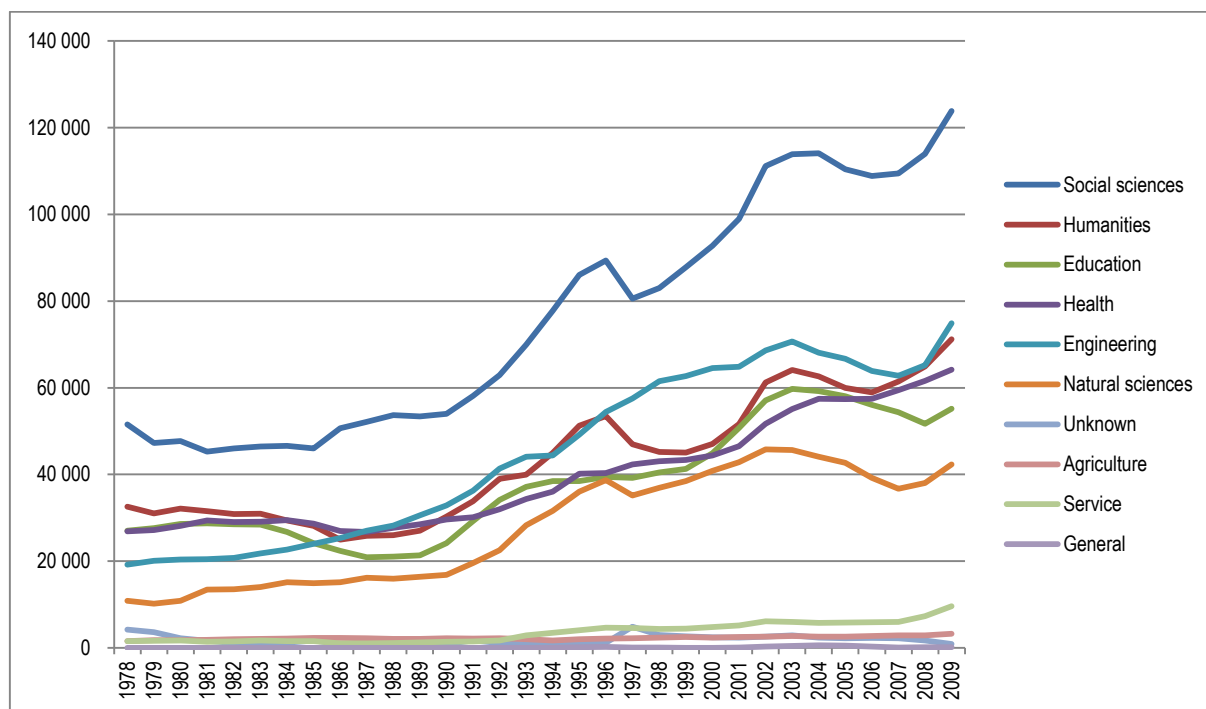
While there have been distinctive changes in terms of the distribution of students on different types of education and over different length of time, the relative position of different fields of study tends to be rather stable over time. An initial conclusion is that the fields of study at the most general level form three distinct groups according to their size. The first is constituted by the by far largest field of study, the Social sciences, as noted accounting for around 30 per cent of students. The second group comprises fields of study accounting for between 5 to 15 per cent, including the Humanities, Education, Health, Technology/Engineering and Natural sciences. These fields of study tend to converge over time. Finally, the third group consists of very small fields of study, representing only a few per cent of students. This group includes the residual categories of General studies and Unknown studies in combination with Services and Agriculture.

However, at a finer level of analysis, some interesting changes can be noted. The Natural sciences raised its share from 6 per cent of students in 1978 to 12 per cent in the latter half of the 1990s, and for Technology/Engineering an increase from 11 to 19 per cent occurred over the same period. These two areas saw their total share augment from 17 to 31 per cent in two decades. Given the overall expansion over the period, the rise is even more marked, going from 30,000 to almost 100,000. This is a remarkable rise, especially from the perspective of on-going discussions about the problems in recruitment to the Natural sciences and Technology/Engineering. In the current debate, the timeframe is clearly much shorter¹³, and when, for example, analysing the figures for the period 1998 to 2008 there is basically no increase in the total number and actually a relative drop from 31 to 25 per cent. Still, the share was clearly above that of 1977. The rise of Natural sciences and Technology/Engineering was accompanied by a decrease for the Humanities that saw a relative loss from 19 per cent in 1977 to 14 per cent in 1998, Health dropped from 16 per cent in 1979 to 13 per cent in the middle of the 1990s, and Education from 16 to 13 per cent during the same years. Looking at the period from the mid 1990s to 2009, Health and the Humanities have regained some of their initial shares (medicine had 15 per cent and the Humanities 16 per cent in 2008), while Education had the same proportion.¹⁴

¹³ For example, the Teknikdelegationen [The Technology Delegation] presents data for 1996 to 2008 (2010:50).

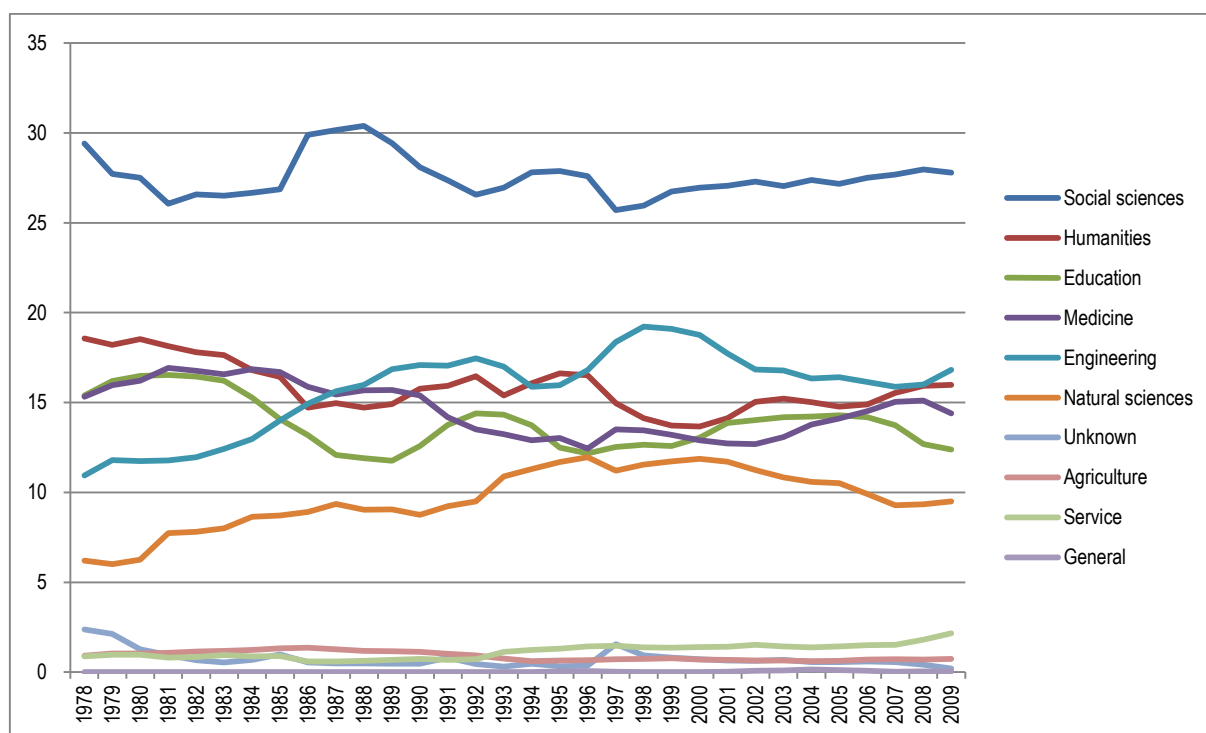
¹⁴ At yet a finer level of analysis, there is one interesting change in the recruitment in the late 1990s and the beginning of 2000s. From 1994 to 1998 there is an increase of the share of students of Technology/Engineering, rising from 16 to 19 per cent. For the same period, Social sciences decrease from 28 to 26 per cent and the Humanities from 16 to 14 per cent. One explanation for this is the types of education offered. Technology/Engineering is to a large degree based on programme studies (programmes make up 80 per cent in the middle of the 1990s) and saw a general increase due to a shift from two year to three year programmes, while the social sciences and especially the Humanities, being basically course based (respectively circa 65 and 90 per cent courses), did not profit from the shift in the programme structure.

Figure 5.15: Students by fields of study, 1978–2009. Numbers.



Sources: Individual based data from Statistics Sweden.

Figure 5.16: Students by field of study, 1978–2009. Shares in per cent.



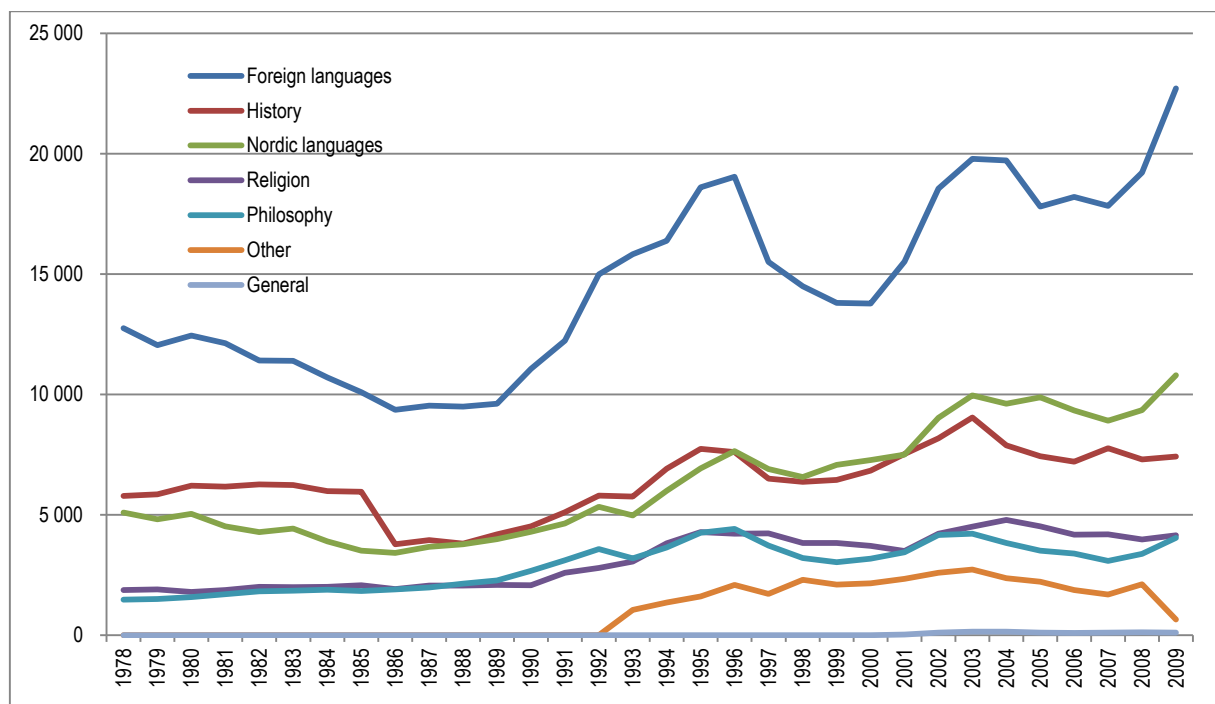
Sources: Individual based data from Statistics Sweden.

From these more general analyses, we will continue by analysing the largest fields in more detail.

5.5.2 The Humanities

For the humanities three major groups of subjects can be identified according to their size. Foreign languages form one distinct group, marked by its clear numerical dominance, being approximately double the size as the second largest subjects, History and Nordic languages, which are twice the size of the third group, Religion and Philosophy. The subjects follow a similar pattern, although the amplitude trails the size. During the 1980s there is a decline with a bottom reached in the late 1980s. Thereafter follows an escalation in the first half of the 1990s, followed by a diminution to the beginning of the 2000s, which once again is followed by a rise and a fall. During the last two years, there is an upswing. In summary, for the Humanities there is a wave-like tendency with rather large swings, especially for Foreign languages. This is probably an effect of that courses constitute the most common type of education in the Humanities.

Figure 5.17: Students in the humanities, 1978–2009. Numbers.



Sources: Individual based data from Statistics Sweden.

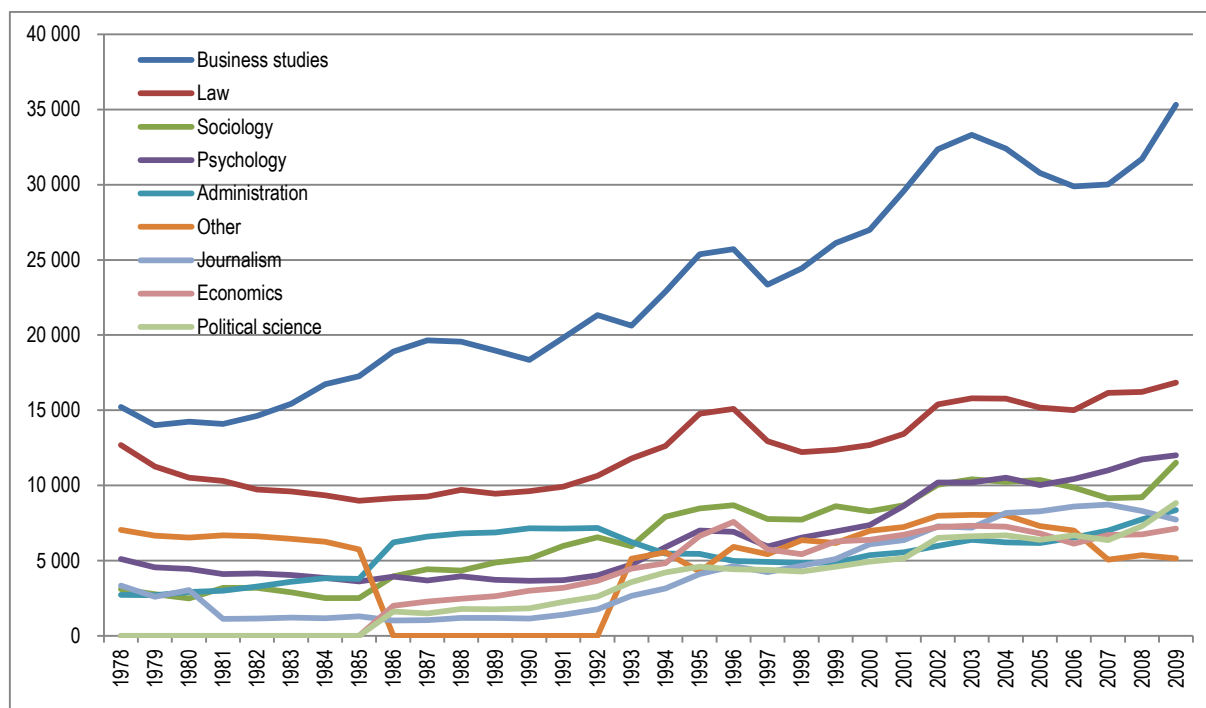
5.5.3 Social sciences

The Social sciences is the largest field of study for the whole period and among its many subjects, one dominates over the whole period: Business studies. The domination also increases over time. While the second largest subject area, Law, was not far behind Business studies in 1978, 13,000 versus 15,000, in 2009 Business studies had 35,000 students and law had 16,000 students, an increase by only 3,000 students. After Business studies and Law, being the first and second subjects for the whole period, a conglomerate of subjects is found: Sociology, Psychology, Administration, Journalism, Economics and Political science. These subjects had between 3,000 and 5,000 students in the late 1970s and did over the period double or tripled their size to roughly between 5,000 and 12,000. Due to some biases in the classification of data, it is difficult to correctly describe the development of all subjects for the whole period.¹⁵ Among the subjects for which there is reliable data for the whole period, we can notice that although Psychology was the third largest subject in 1978 (if leaving the

¹⁵ Economics and Political science especially are not accurately accounted for, having no students between 1978 and 1985 (probably included in the category of Others for this period). The figure for Economics is to some extent underestimated since all students studying a Business programme are classified as students in Business studies, although a substantial part of the programme consists of courses in Economics.

residual category other out) and in 2009, it was for almost fifteen years, between 1987 and 2001, outnumbered by Sociology, and between 2002 and 2005 equal in size.

Figure 5.18: Students in the social sciences, 1978–2009. Numbers.

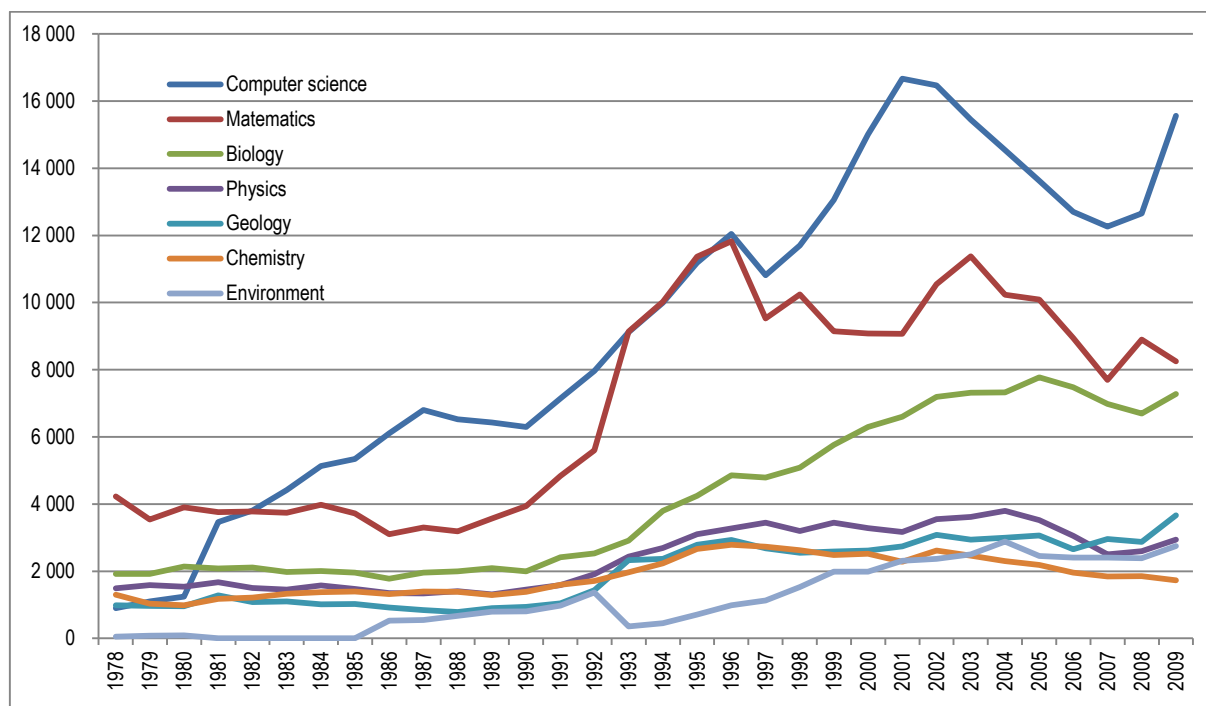


Sources: Individual based data from Statistics Sweden.

5.5.4 Natural sciences

In Natural sciences, major shifts have taken place. At the end of the 1970s, Mathematics was the largest subject group (we have here merged it with statistics) with just over 4,000 students. No other subject came over 2,000 students at the time. Thirty years later, Computer science had become the major subject with almost 16,000 students, and Mathematics was a distant second subject at about half the size (8,000). Noteworthy is that while Computer science has had a steady growth until 2001 (when the IT-sector collapsed), and thereafter a downslide and in the last years recovered to the level of 2001, Mathematics had a stable level at 4,000 students up until 1990 and thereafter a very rapid growth, reaching 12,000 in 1996 (a tripling in six years!) followed by a downturn for more or less the rest of the period. One subject with a steady rising profile is Biology, which has grown to almost the size of Mathematics. Physics, Chemistry and Geology have been rather similar in size and about double their numbers over the period. Environmental studies is together with computer science a rising star, but at lower altitude, growing from almost non-existence to the middle of the 1980s and taking off in the latter part of the 1990s to reach 2,500 students in the 2000s.

Figure 5.19: Students in natural sciences, 1978–2009. Numbers.

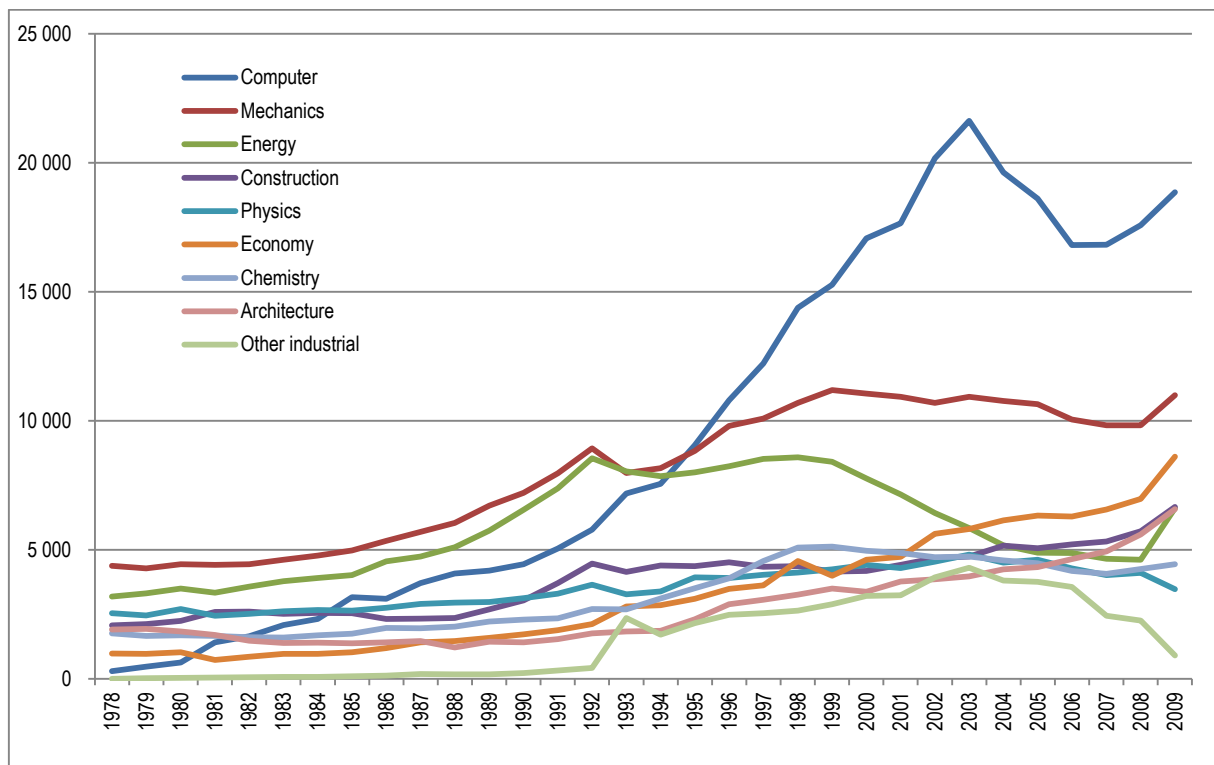


Sources: Individual based data from Statistics Sweden.

5.5.5 Technology/Engineering

As for Natural sciences, the Computer area is rising very fast in Technology/Engineering, from an almost zero-level in 1978 to become the largest subject in the middle of the 1990s and having a continued rapid growth until 2003. It is reasonable that the peak came a few years after the IT sector crash in 2001 since most students are programme students creating a time lag; after this the curve went down until 2006 when it re-established itself somewhat. This can be contrasted with Energy, which was the second largest field in 1978, experienced a steady growth to 1992 after which it saw its numbers decline to become the sixth largest field in 2008. Mechanics was the largest in 1978 and kept that position until 1992, when Computer overtook it. During the last 15 years a stable number around 10,000 students has been maintained, which in fact mean a loss of relative position since the overall number of students has increased substantially. For Technology/Engineering education, it is clear that the reform in 1993 meant a break in the development in the area. Whereas all fields increased slowly but steadily before the reform of 1993, the fields develop in very different fashion afterwards. Computer engineering saw its numbers rise very fast, the second largest areas, Mechanics and Energy, witnessed stagnation or decline, while most smaller fields continued to grow steadily but at a low level.

Figure 5.20: Students in technology, 1978–2009. Numbers.

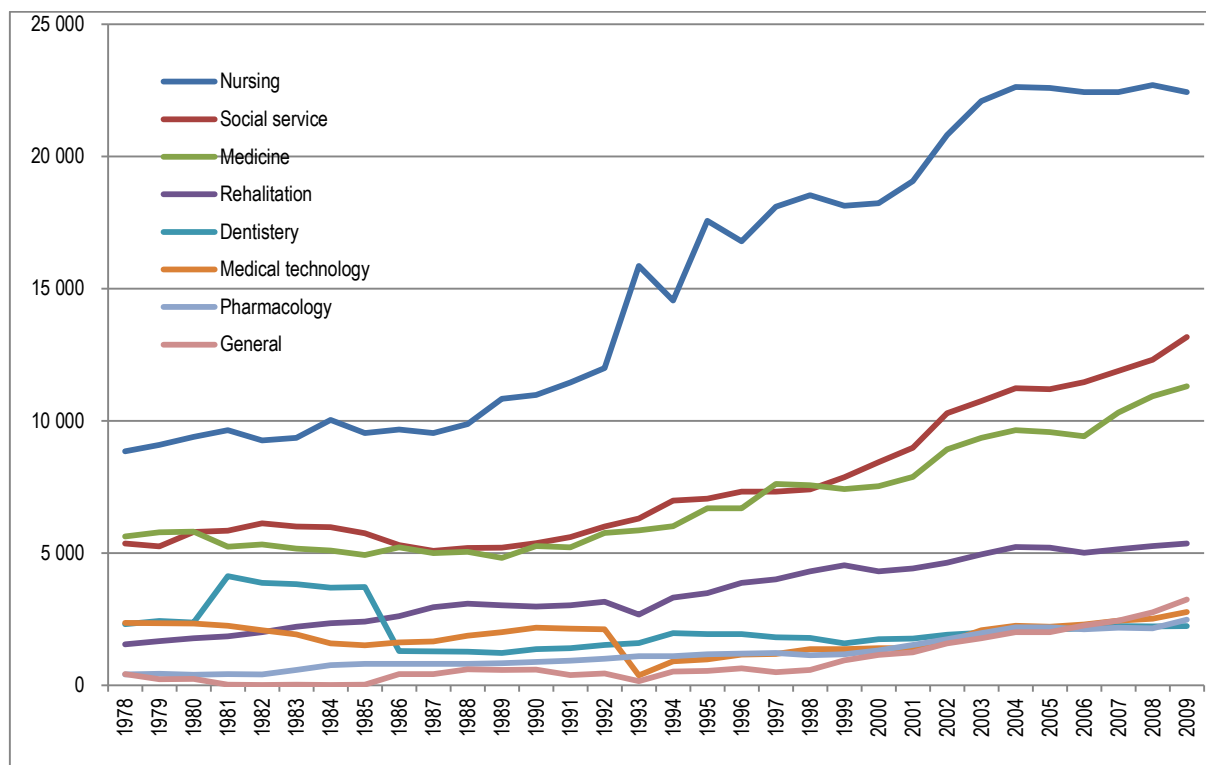


Sources: Individual based data from Statistics Sweden.

5.5.6 Health and medicine

Health and medicine is the most controlled area, dominated by professional education and strictly regulated according to the needs of the health sector. Thus, education in Medicine, health and social services has taken on a slow and steady growth with no large deviations. Most fields have tripled their size over the period and keep their positions relative each other. Nursing is clearly the largest field over the whole period, about double the size of education in Social service and in Medicine, which in turn have doubled the number of students in Rehabilitation. During the 2000s the smallest educational fields, Dentistry, Medical technology, Pharmacology and General education in health, were almost equal in size, established at a level of 2,000 students.

Figure 5.21: Students in health, medicine and social services, 1978–2009. Numbers.



Sources: Individual based data from Statistics Sweden.

5.5.7 Teacher education

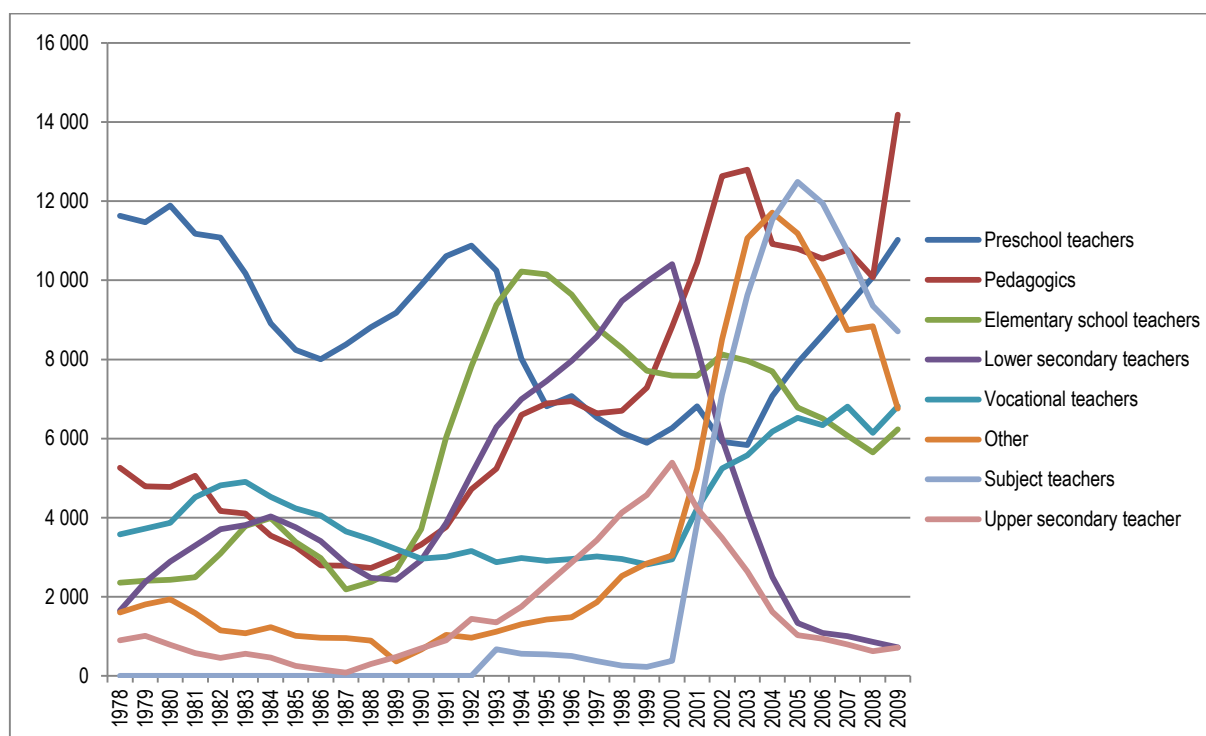
Finally, Teacher education forms a field of study that differs from the others in one aspect. The different reforms of Teacher education have created a complex structure of educational programmes that makes it difficult to see larger trends, as evident from the figure. Besides the three major reforms of the whole system, in 1977, in 1993 and in 2007, Teacher education was reformed in 1988 and in 2001. All these five reforms have in different ways effected Teacher education. Historically, there have been two very different teacher education traditions, one for class teachers who were educated outside the universities in special seminaries, and one for subject teachers who studied their subjects at the university and who after a year of practice at a school became teachers. The reform in 1977 meant a fundamental break with the separation of the two traditions by including the class teacher education tradition within the higher education system. In fact, when many new university colleges were established they were built around the teacher seminaries in combination with nursing schools. From 1977 to 1988 there existed four main types of programmes for teachers: pre-school teachers, class teachers for the ages 7 to 9, class teachers for the ages 10 to 12, and subject teachers. Added to this is education for leisure-time pedagogues and special teachers.¹⁶ The reform in 1988 meant that a new programme was created, upper secondary school teachers, and that two new, overlapping categories for teachers in compulsory education were differentiated: teachers for school years 1 to 7 and teachers for school years 4 to 9.¹⁷ The reform in 1993 had no specific effects on teacher education, but the reform in 2001 meant profound changes. Instead of different degrees, one single degree for teachers was introduced, and within this degree the students were given great freedom to compile the content of their own education. In addition, a common core of one and half years of studies was introduced for all teachers. A consequence of the new programme was that it became

¹⁶ In our classification we have merged Pre-school teachers with Leisure-time pedagogues. We have also merged the different class teachers into one category, but differentiated the subject teachers according to whether the education primarily aims for the last years of compulsory school or the upper secondary school.

¹⁷ These programmes fit well the classification used.

difficult to determine the content of the studies according to the classification scheme used.¹⁸ The new common programme was heavily criticised and already in 2011 a new teacher education reform was effectuated, involving four separate degrees.

Figure 5.22: Students in teacher education, 1978–2009. Numbers.



Sources: Individual based data from Statistics Sweden.

The different reforms of teacher education make it complicated to follow the development of the area over time. To start with the ones that have been fairly consistent over the period: the Pre-school teacher programme (here also including leisure-time pedagogues, which had a minor share of the group over the whole period) has seen a declining tendency. From being by far the largest programme in the late 1970s and the 1980s (although oscillating from 12,000 to 8,000 and back), it dropped during the 1990s to the level of 6,000, but during the 2000s recovered to almost 12,000 again, back at position one of the teacher education programmes. The Vocational teacher programme had a stable recruitment of 3,000 to 4,000 up until 2001, when the numbers started to increase to over 6,000. For the other categories, it is clear that the reform in 1988 meant a clear expansion of teacher education. Both the new programmes, teachers for school years 1 to 7 (Elementary school teachers) and teachers for school years 4 to 9 (Lower secondary teachers) increased rapidly from 1988. Elementary school teachers reached a peak in 1994, and Lower secondary teachers in 2000, the last year before the programme was abolished with the reform of 2001. Also Upper secondary teachers, introduced as a new programme in 1988, climbed continuously up until 2000, but at a lower level than the other programmes. The introduction of a single degree programme in 2001 had the effect that the category of Other increased rapidly, from 3,000 in 2000 to almost 12,000 in 2004. Also the category of subject teachers (with no determination of teaching in compulsory school or upper secondary school) raised fast to over 12,000 in 2004. This latter education substituted both the programme for subject teachers in upper secondary school and the programme for subject teachers in compulsory school. The category of class teachers in compulsory school has seen its numbers decrease steadily, from above 10,000 in 1994 to below 6,000 in 2008. Finally, we can notice that pedagogics has grown after an

¹⁸ The category of other expands from 2001.

initial fall back during the first decade. From below 3,000 in 1988 it increased to almost 13,000 in 2003 and reached over 14,000 in 2009.

To sum up, the teacher education programmes and pedagogics is the area that has had the most turbulent development, mainly due to additional reforms in 1988 and 2001 that profoundly transformed the educational offer. It is difficult to see any general trends, besides that the reforms clearly affected recruitment. Moreover, since it becomes more difficult to classify the content of the studies after 2001 (as for example the category Other increases rapidly) it is problematic to say anything more precise about the recruitment structure over the whole period.

5.5.8 Conclusions

The analyses of the development of specific subjects and programmes reveal different patterns according to field of study. Medicine and health forms one example where there has been a steady increase in the number of students in all subjects. This is probably an effect of the area having a large proportion of professional education which is highly regulated by the health care system, the state and regional authorities. The Natural sciences and Technology/Engineering in many ways function in the opposite way. Technology/Engineering especially, but also to a substantial degree Natural sciences, are close to the private sector and thus attuned towards the needs of the industry. We can here see a fast development of Computer engineering and Computer science up until 2001 when the IT-sector crashed. With the market crash, the number of students fell drastically, implying a strong link between the educational system and the industry. In recent years the number of students has recovered and the industry is expanding again. Similar, but at a lower level, Biology has seen a rising trend with the expansion of life sciences as an increasingly important industry.

The Humanities and the Social sciences constitute two sectors more autonomous as regards both the public and the private sector. In comparison with Technology/Engineering and Natural sciences, there are smaller changes in both areas. The relative size of the largest subjects tend to be the same over the period, and there are no expansions and fall backs as for computer education within the areas. The differences are of lesser magnitude, sometimes not recognisable at the 3-digit level. This is for example the case for foreign languages, where English keeps its dominating position, but French and especially German are losing ground, and Spanish and other, in the Swedish educational system, smaller languages are gaining (Börjesson & Bertilsson 2010:32–33). In Social sciences it is notable that Business studies increases extensively in absolute terms, whereas the second largest subject, Law, sees a more moderate growth, leaving Business studies the indisputable giant in the area.

In contrast to all other areas, teacher education and pedagogics is to a large degree marked by the area specific reforms in 1988 and 2001. These reforms have created three distinctively different sets of educational programmes for teachers (1977–1987; 1988–2000 and 2001–2010), where no educational programme except that for pre-school teachers remains stable over the whole period. This makes comparisons over time very difficult. In addition, older programmes are overlapping newer ones, obscuring the picture even more. Furthermore, the category of Other (including unspecified) has grown rapidly after 2001. Given these obstacles for comparison, there is a tendency for fluctuations, as for example for the Pre-school teacher programme: clearly largest for a decade, it lost half of its number in the late 1990s, and was back at the initial level in the 2000s. Another clear tendency is the escalation of Pedagogics.

The more detailed analyses thus show that although there has been an overall growth of enrolment in Swedish higher education, and that the areas have contributed fairly equal to the expansion, there have been important internal differences and the areas have developed in varying fashions. The differences between areas seem to largely be determined by their relationship to the labour market, the national economy and the development of the welfare state. Areas oriented towards industrial production, such as technology and natural sciences, tend to change their composition more profoundly than areas such as medicine that are more related to the need of labour in public services, or teacher education, where the demand of labour is also more stable and easy to forecast.

5.6 Institutional landscape

5.6.1 A typology

The history of the institutional landscape of higher education in Sweden, defined according to its contemporary borders, can be described as moderately expanding for the first three centuries, and there after gradually increasing to expand more rapidly in the post war period. The rate of expansion is related to the growth of the overall student population, but it is not a perfect match. As will be shown, the expansion of the number of students over the last 50 years has predominantly been conditioned by a growth of the number of student at each institution.

The landscape of higher education can be described by distinguishing five basic types of institutions, with different functions, histories and positions. First, the oldest category is the universities, that can be defined, as the name indicates, by their universal claim, that is, they comprise a large variety of faculties. Today these institutions combine education with extensive research in a large number of disciplines. They set themselves aside by their size, with regard to overall funding and number of staff and students. The second category is the specialised institutions, mainly in engineering, medicine, economics and agriculture. This category is the third oldest, the earliest institutions were funded in the 18th century, and have today, as the universities, large resources for research and an important educational programmes and courses, but both research and education is restricted to basically one faculty. The art institutions form a third category. They are the second oldest with a number of institutions with its roots dating back to the 18th century. As the specialised institutions, they are primarily oriented to a specific domain, and it is often even more narrowly defined as a certain discipline such as dance or theatre. In contrast to the specialised intuitions, up until today, research has played a minor, or even non-existing, role, and they have built their exclusive position on their crucial relation to the artistic field they are related, or even form part of. These three categories were all at place when higher education was to be regarded as an elite system, in the sense of Martin Trow, only comprising a few percentage of an age cohort.

The fourth category, the university colleges, and to a large extent the fifth category, the health colleges, are related to the age of massification of higher education. The university colleges were largely a creation of the major reform in 1977, and have as the universities certain broadness in their educational scope, covering at least three or four faculties, although not as many as the universities,. However, they lack substantial funding for research and are basically teaching institutions. They also differ significantly from the universities with regard to their organisation. Few have adopted the organisational pattern of one discipline per department and faculty organisation dominant, at least up until today, at the traditional universities. Instead, the departments tend to be large entities covering a wide range of disciplines, and the overarching levels are defined according to logics other than the traditional faculty divisions. Furthermore, the university colleges are often build around a set of semi-professional educational programmes, often teacher education programmes, nursing programmes and shorter engineering programmes; traditional disciplines such as history, languages, physics, and political science normally have weak positions. The fifth category, the health colleges, shares a number of traits with the university colleges. They were also integrated in the higher education system by the reform of 1977 and they are also basically teaching institutions, built on professional programmes, mainly the nursing programme. In addition, they lack proper resources for research. A difference is that they are defined by their orientation towards one specific area, health and medicine. While, as we will see, the university colleges have expanded rapidly during the last two decades, the health colleges have had a very different development. Almost all of them have during the last period been integrated into larger entities, both universities and university colleges. The remainders are the few old ones, based in the Stockholm area.

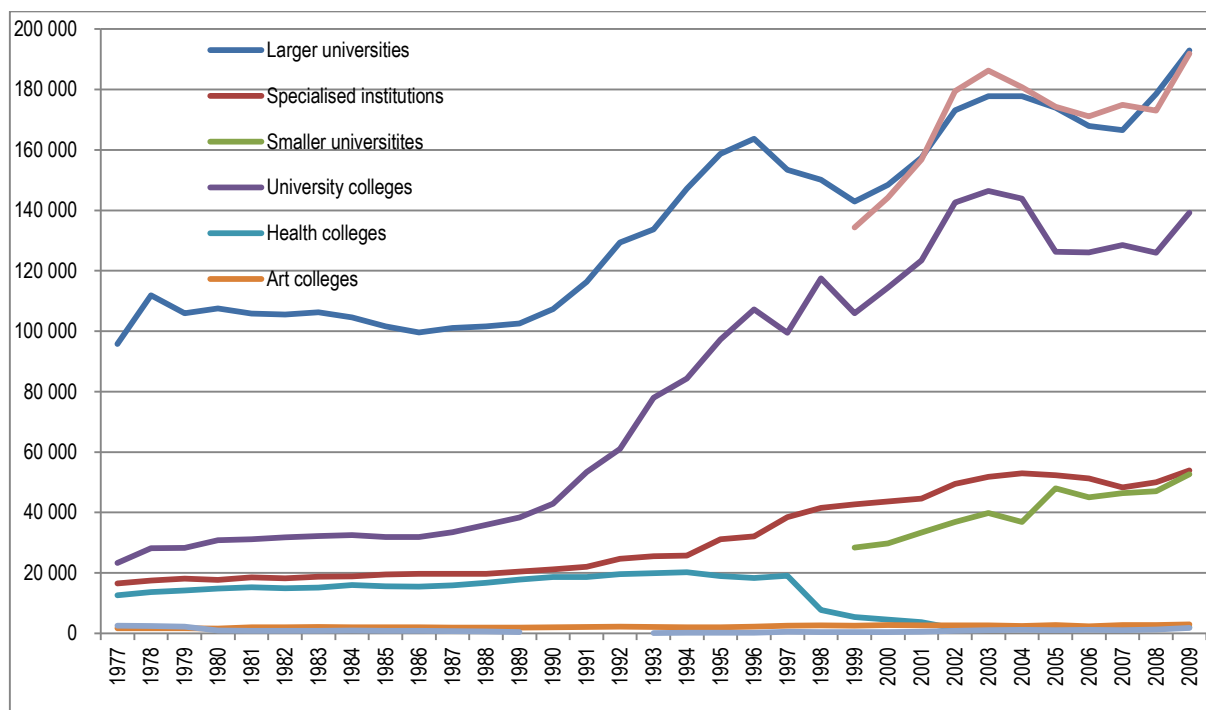
In addition to these main five types, we can add a category of other institutions. This includes very small specialised institutions in theology and psychology and larger entities such as Försvarshögskolan (the Swedish National Defence College), that were given higher education status

in 2008. In terms of the number of students, this category is marginal. A final category, that we think is important to introduce in order to understand the current landscape of higher education is new universities. This category includes the four universities that have received their status since 1999 and are built on former university colleges. Our argument for giving these institutions a special category is that they still differ significantly from the older universities in terms of resources for research and in their educational profile; they lack most of the longer professional programmes that are exclusive to the older universities and the specialised institutions. This taken together gives them clearly different conditions from the traditional universities and the specialised institutions.

5.6.2 The development of types of institutions

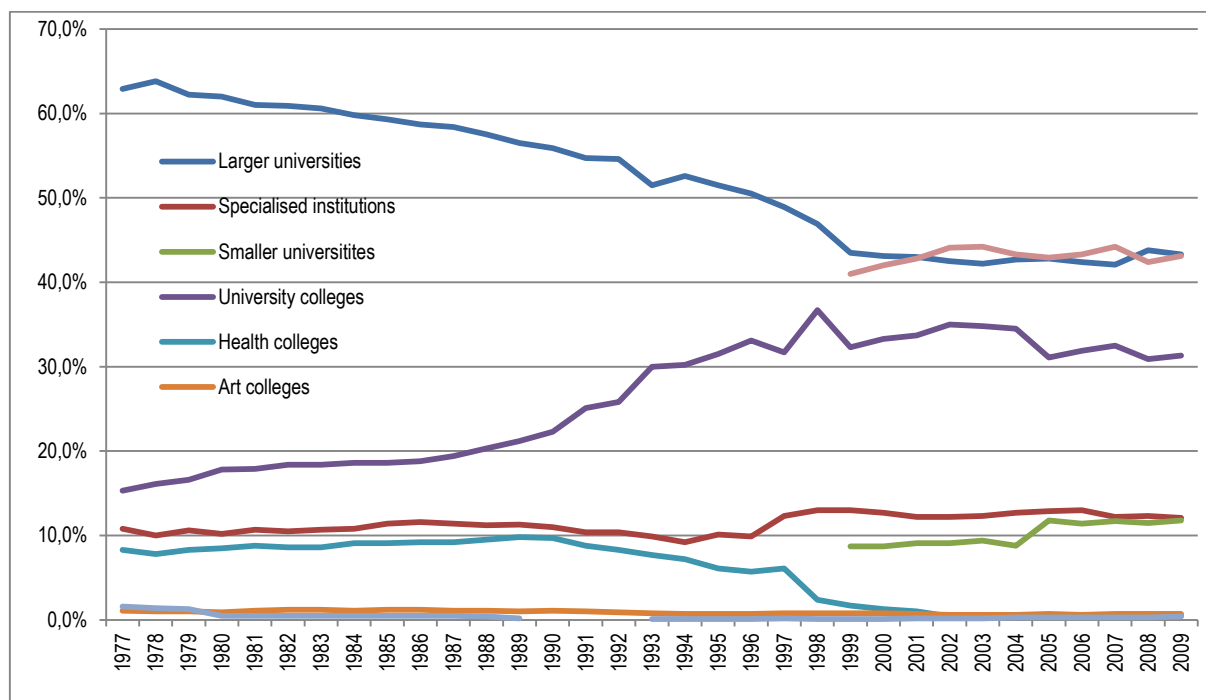
For the period 1977 to 2009, the size of the different institutional types has changed significantly. In 1977, the larger universities accounted for around 100,000 students, while no other category reached over 25,000. The university colleges, the specialised institutions and the health colleges had between 15,000 to 25,000 students, while the art colleges and the other institutions had in comparison very few students, summoning some 1,000 to 2,000 students. These levels were more or less stable during the 1980s, but changed thereafter drastically. All the three largest types of institutions (larger universities, university colleges, and specialised institutions) grew steadily during the 1990s, but the increase was especially strong for the university colleges, going from 39,000 students in 1989 to 117,000 in 1998 (a tripling in less than 10 years). In 1999, the university colleges in Karlstad, Växjö and Örebro were granted the status of universities. We have categorised these, together with Mid Sweden University, as smaller universities since they have significantly smaller means for research than the larger universities. If we add the smaller universities and the university colleges, the two categories are since 1999 equalling the larger universities in size. The larger universities have thus gone from being the major provider of higher education, accounting for more than 60 per cent of the students, to an equal player with the university colleges and the smaller universities, both gathering just over 40 per cent.

Figure 5.23: Students by type of higher education institution, 1977–2009. Numbers.



Sources: Individual based data from Statistics Sweden.

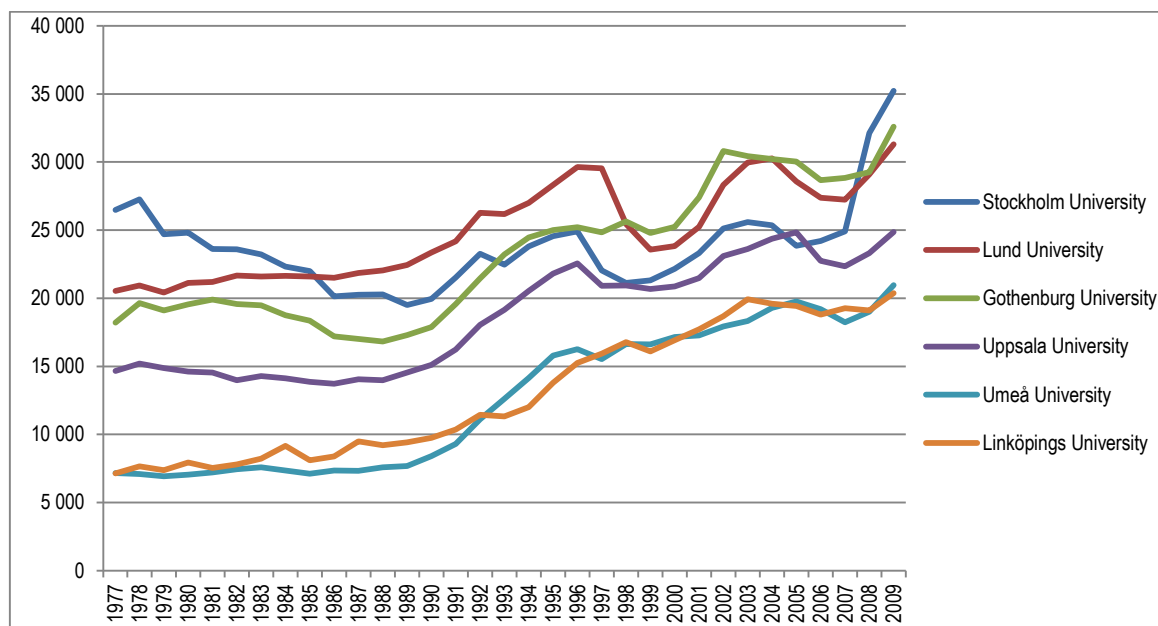
Figure 5.24: Students by type of higher education institution, 1977–2009. Shares in per cent.



Sources: Individual based data from Statistics Sweden.

Looking at the different types of higher education institutions in more detail there are some similar patterns of development but also some changes internally when it comes to student enrolment. The larger universities have, as a category, as noted above, expanded in numbers during the period 1977-2009. A general pattern over the whole period is that the quite large differences in the beginning of the period (Stockholm University accounts for almost four times the number of students at Umeå University and Linköping University) are substantially reduced over time (Stockholm University being less than double the size of Linköping University). The reduction is the result of a more extensive expansion of the smallest universities, increasing their numbers by a factor of three; while the largest universities faced less than a doubling. At the level of individual institutions, the largest one based on number of students was in 1977 Stockholm University, followed by Lund University, Gothenburg University and Uppsala University; then there is a small gap down to Umeå and Linköping (see figure 5.25 below). The number of students in Stockholm declined from the beginning of the 1980s to the beginning of the 1990s and was passed in numbers by both Lund and Gothenburg. However the merger of Stockholm University and Stockholm Institute of Education in 2008 again made Stockholm the largest university institution with more than 35,000 students in 2009.

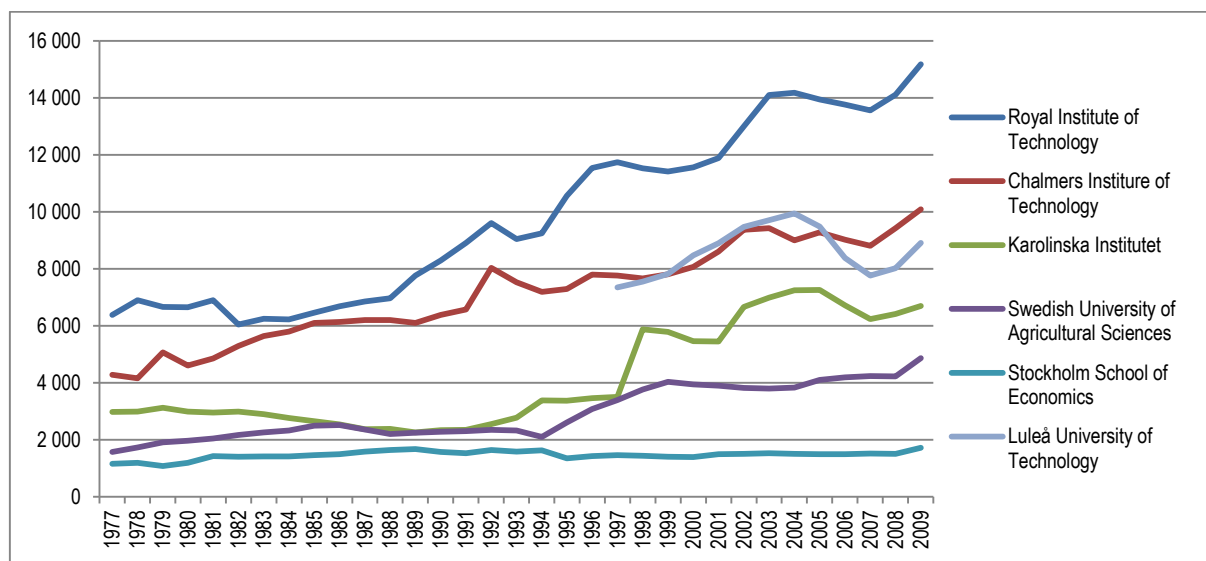
Figure 5.25: Students by university, 1977–2009. Numbers.



Sources: Individual based data from Statistics Sweden.

The specialised institutions follow a different trend from the universities: instead of converging, they tend to diverge. The largest and the second largest institutions at the beginning of the period, the Royal Institute of Technology and the Chalmers Institute of Technology, increased steadily over the whole period, raising their number by a factor of 2.5. To the specialised institutions in technology, we need, from 1997, to add Luleå University of Technology that set out at the same level as Chalmers Institute of Technology. The expansion of the institutions of technology is paired with the overall expansion of the field of technology over the period (see above). At the same time, the third largest institution in 1978, The Karolinska Institute, less than doubled its number of students, and the whole increase took place between 1992 and 2004. From 1978 to 1992, the number actually decreased. The smallest institution in 1978, Stockholm School of Economics, shows the most particular pattern, in fact, not expanding its numbers at a significant rate during the whole period. This implies that the studies at the most prestigious institution in economics and one of the most important institutions for entrance to the world of big business and high administration in Sweden has become more exclusive in relative terms over a period of vast expansion of the higher education system in general and of business studies in particular.

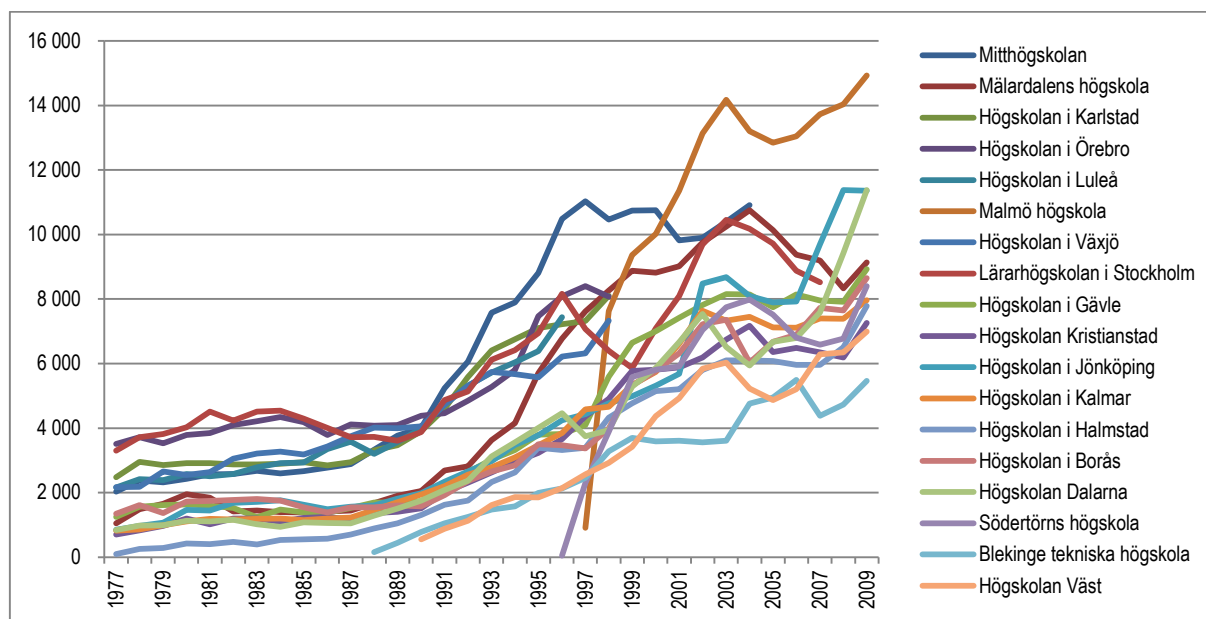
Figure 5.26: Students by specialised institution, 1977–2009. Numbers.



Sources: Individual based data from Statistics Sweden.

In comparison with the universities the increase in number of students at the university colleges is proportionally larger over the whole period. The trend is most evident from the 1990s and onward. The figure also shows that the area has become rather diversified in size. During the first 15 years, all institutions had up to 4,000 students and had a fairly stable size. There is a tendency to a differentiation in two major types of institutions, smaller university colleges and larger university colleges. From the reform in 1993 and onwards the sector has become clearly more diversified. Some examples: Mithögskolan increased very rapidly during the 1990s and became the largest university college from 1991 to 2000. Mälardalens högskola went from being a smaller university college to a larger from 1992 to 1996. An even more rapid expansion is Malmö högskola, becoming the largest university college in 2001, four years after its establishment. There are also quit substantial shifts during the latter part of the period. Two university colleges that witness a striking growth are Högskolan i Dalarna and Högskolan i Jönköping, which both rise to a shared second place in 2009 by adding 3,000 to 4,000 students in three or four years. At the same time, Mälardalens högskola dropped from a second to fourth place and lost 2,000 students. Lärarhögskolan i Stockholm is perhaps the clearest case of drastic shifts, going to 8,000 students in 1996, down to 6,000 in 1999, up to over 10,000 in 2003, and down again, to 8,500 in 2007, the year before it became part of Stockholm University.

Figure 5.27: Students by university colleges, 1977–2009. Numbers.



Sources: Individual based data from Statistics Sweden.

5.7 Internationalisation

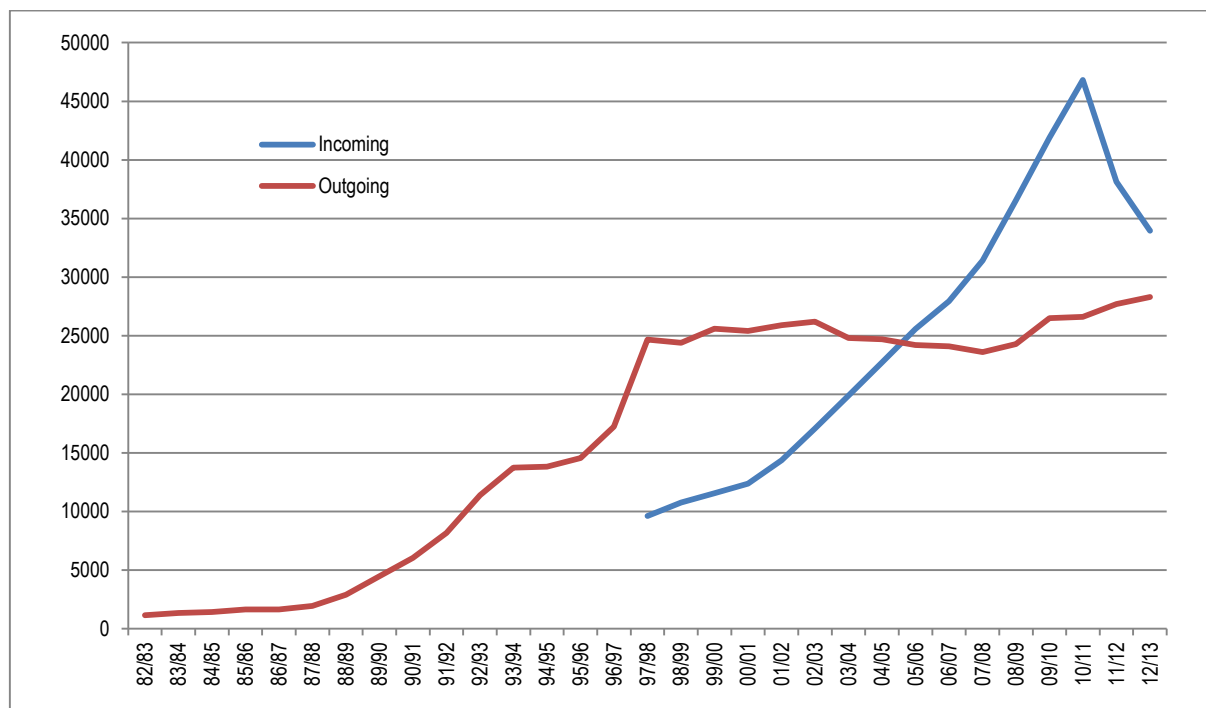
The internationalisation of Swedish higher education is a multifaceted phenomenon that relates to individuals, such as students, teachers and researcher, and to institutions, ranging from the higher education institutions and public administrative bodies to private foundations specialised in supporting academic migration. It covers mobility of individuals and ideas over national borders, as well as changes of the curriculum to adopt a more internationally oriented content, and in the case of the Bologna implementation, restructuring of national systems of higher education according to international models. We will in this context solely focus on student migration, as it most obviously relates to the theme of this report, enrolment.

For the Swedish context, student mobility patterns are affected by major changes at the policy level and overall increased internationalisation of the Swedish society with especially the entrance of Sweden to the European Union in 1994. The latter process meant that Swedish higher education institutions were given the opportunity to become part of the Erasmus networks, and that Swedish students could take part in the exchange programmes. Before this, an even more fundamental change had come about in 1989 with the introduction of general study loans and support for studies abroad. That this had a clear impact on the number of outgoing students is obvious from the figure below. The numbers were rather stable around 1,000 to 2,000 students up to 1989, but increased steadily with annually circa 2,000 students and reached 25,000 students by 1997/98, a more than tenfold expansion in less than a decade. After that, the level has been very stable at around 25,000 students. This however implies that the outgoing students form a reducing share of the overall number of students since this has continued increasing throughout most of the 2000s.

The numbers of incoming students were from first the years with available data, 1997/98, clearly lower than the numbers of outgoing students, but the trend was rising and in 2005/06 incoming students surpassed outgoing. Sweden had changes status from a net exporter to a net importer of international students. The rising trend continued up until 2010/11 with a peak at over 45,000 incoming students, with a sharp decrease thereafter to below 35,000 in 2012/13. This decrease is to a large extent explained by the introduction of student fees for international students from so-called third countries, i.e. non-EU or ESS countries (Prop. 2009/10:65). In order to understand the recent expansion of

higher education in Sweden, it is necessary to acknowledge the importance of the increasing numbers of incoming students in the 2000's.

Figure 5.28: Number of outgoing and incoming students, 1982/83 to 2012/13. Both free movers and exchange students.



Sources: Outgoing students 1982/83–1996/97: CSN, unpublished statistic; incoming and outgoing students 1997/98–2002/03: HSV 2007:9 R; incoming and outgoing students 2003/04–2007/08: Statistiska centralbyrån UF 20 SM 0901; incoming and outgoing students 2008/09–2012/13: Statistiska centralbyrån UF 20 SM 1302.

5.8 Conclusions

The Swedish system of higher education has, since the 1950s, experienced an extraordinary expansion in number of students. As an illustrating figure the number of registered students increased from 17,000 in 1950 to 431,000 in 2011. The expansion has however not been linear. The greatest increase in enrolment occurred in the 1960s, when the yearly average growth rate was 8 per cent, respectively the 1990s, with a yearly growth rate of 5 per cent between the years 1988 to 2003. The periods in between these years of great expansion is instead characterised by ruptures in the expansion and even a decrease in numbers for some years, for instance the period from 1970 to 1976. Analysing the period of expansion in relation to the demographic development has shown differences in the driving forces behind. The 1960s expansion largely coincided with a growing number of 20 year olds in the population. The 1990s expansion was instead largely attributed to labour market changes and an economic recession, and the growth occurred despite declining youth cohorts, creating a very sharp rise in the admission rate of an age cohort.

One important aspect of the growth periods is the increasing numbers of female students visible in both phases of the expansion. The proportion of women exceeded the proportion of men in the late 1970-s – partly as a result of the incorporation of female dominated programmes in the higher education system 1977 – and has increased over time.

The general expansion of the higher education system has meant different things for different areas of study. On an aggregated level, courses, general programmes and professional programmes have contributed to the expansion and most fields of study have witnessed an increase in number of students. The more detailed level shows that although there has been an

overall growth of enrolment in Swedish higher education, and that the areas have contributed fairly equal to the expansion, there has been important internal difference and the areas have developed in varying fashions. The differences between areas seem to be largely determined by their relationship to the labour market, the national economy and the development of the welfare state. Areas oriented towards industrial production, such as technology and natural sciences, tend to change their composition more profoundly than areas such as health and medicine that are more related to the need for labour in public services, or teacher education, where also the demand of labour is more stable and easy to forecast.

Parallel to the growth of the number of students the institutional landscape has been reshaped. Up until the end of the 1970s the landscape was largely dominated by the big universities, accounting for around 100,000 students, while no other category reached over 25,000. All the three largest types of institutions (larger universities, university colleges, and specialised institutions) grew steadily during the 1990s, but the increase was especially strong for the university colleges, with a tripling of student numbers in less than 10 years. As a result the university colleges and the smaller universities have gone from being a marginal provider, in terms of student numbers, to an equal player to the larger universities.

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6 Conclusions

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6.1 Introduction

It is often said that there exists a specific “Nordic model of higher education”. This model is characterised by largely publicly-owned systems, which are relatively closely regulated by the state, include high levels of public funding and no or low student fees, and has strong influences from egalitarian traditions. In such model, higher education has also been seen as an important pillar in the welfare system, not only through the emphasis on broad and equal access, but also by educating the professionals needed for the development of the welfare state (Välimaa 2005; Vabø and Aamodt 2008; Gornitzka and Maassen 2012).

However, there is today increasing evidence that the Nordic systems of higher education have moved in new directions and it is now an open question if a unified model still exists. Among the most important transformations we can mention the following. The number of students has increased drastically and this has also involved the establishment of new institutions. In the examined Nordic countries, the expansion has produced relatively large higher education systems in comparison with many other European countries.¹⁹ Internationalisation has become a more integrated part of the national systems and an increased emphasis on efficiency, competition and market orientation has been apparent. The Bologna process has been implemented – in itself an indication of the increased importance of the international level – although time tables and the degrees of adjustments have varied (Kim 2002; Tomusk 2006, Kehm, et al. 2010). In short, the systems appear to have been transformed from cohesive and standardised systems, administered largely within the nation state, into more diverse and complex national and international higher education landscapes.

The aim of this report has been to give an overall account of one particular aspect of the landscape of higher education in the Nordic countries, that is, the enrolment patterns in Denmark, Finland, Norway and Sweden. Each country was devoted a separate chapter. Enrolment was analysed from a range of different angles. First, we study the overall numbers of students over the last half century. This implies that we captured the two largest waves of expansion of higher education in modern history, that is, the ones in the 1960s and 1990s. In addition to the total number of student enrolled, the number of entrants and degrees taken was considered and all this is set against the demographic development. For these general analyses of the expansion, we also took into account differences between men and

¹⁹ According to OECD data from 2012, the ratio of tertiary students to country's population was highest in Finland (5.7 per cent). Denmark (4.9 per cent), Sweden (4.8 per cent) and Norway (4.7 per cent) are near each other (see <http://stats.oecd.org>).

women. Second, the enrolment was analysed with regards to different types of education, such as divisions between courses and programmes, types of programme and the length and the level of the educational programmes. Third, the dispersion of the students over the fields of study was analysed on different levels of aggregate. Fourth and finally, the enrolment was analysed in relation to the landscape of higher education institutions, depicted by types of institutions as well as specific institutions. In this conclusion we will draw upon the themes analysed for each country and compare the results cross-nationally.

6.2 The overall expansion

The four studied countries, Denmark, Finland, Norway and Sweden, have all expanded their systems of higher education on a monumental scale from after the Second World War up until today. Roughly, the systems have expanded more than tenfold in a period of a little more than a half century, and we have seen a transition from systems of elite education to mass education to now having reached a stage of universal access. Higher education in 2014 simply means something very different from what it meant in 1954.

The expansion has clearly taken similar shape in the four countries. There have been two large phases of expansion, first in the 1960s and a second one in the 1990s and the early 2000s. However, very different conditions were at hand for the two phases. The first expansion of the 1960s was implemented at a time of long and stable economic growth and an increasing demand for a more skilled labour force. This was also driven by a demographic growth, especially when the baby-boomers of the 1940s reached the age of university entrance in the 1960s. This stands in sharp contrast to the expansion of the 1990s, which occurred in a time of economic stagnation and crisis and with a declining youth population. When the two phases of expansion are related to demographic factors, it becomes clear that the expansion of the 1960s does not seem that dramatic in terms of the share of an age cohort entering higher education – although it clearly increased there was no sharp upturn – while the expansion of the 1990s showed a more pronounced increase in the proportion, since the expansion occurred at a time of decreasing numbers of relevant age cohorts.

Without going too much into the details of the social aspects of the expansions (which will be dealt with in forthcoming reports and publications) we need to highlight the importance of the enlarged participation of women in higher education as a major force of the expansion. Women increased their share of student population throughout the whole period, and a substantial part of the expansion must be attributed to the fact of women first equalling then overtaking the rate of male students. It is also striking that men and women differ somewhat in their enrolment patterns. The number of women tended to increase more than men in the 1990s and they continued to expand longer. This could be interpreted in relation to the economic conjuncture: men tended to leave higher education as soon as the economic tide shifted in a more positive direction.

There are of course a number of factors driving the overall expansion of the system. We will here briefly discuss some of the most important ones. First, on a macro societal level, the economic transition from a society largely based on agricultural production to an industrial society, and to today's post-industrial service-based economy is closely related to the expansion of the educational system in general, and the higher education system in particular. The Nordic countries are no exception to these transformations.²⁰

²⁰ Employment in agriculture has decreased from more than one third of the labour force in the 1930s to around three per cent at present (Hansen & Skoglund 2008). In the years from 1960 to 2007, the proportion of the Danish labour force in primary industries dropped from 17 to 3 per cent (Danmarks Statistik 2008). The industrial and commercial development in the Nordic countries, as in other OECD-countries, has since the 1970s been characterised by declining employment in manufacturing and increasing employment in the service industries. In Sweden, the share of the work force employed in manufacturing fell from 33 per cent in 1962 to 21 in 2000 (Edvinsson 2005). As part of this development, we have also witnessed increased employment in the public sector in the Nordic countries, which among other factors is due to an expansion of the public health industry and education. In Norway, public employees' share of

A second parameter for explaining the growth is the political ambition to expand the system and actual implemented changes of the system to enable an expansion. A central condition here is funding. Increasing funding to the sector obviously facilitates an augmentation of the number of enrolled. Related to this are the admission principles, if all those eligible are granted access or if the number of those admitted is regulated (*numerus clausus*). A less regulated admission system is of course more favourable for expansion. In Sweden, for the faculties of the humanities such an open system was combined with generous funding, i.e. the automatic principle where new enrolment automatically led to increased funding, and this became the most crucial factor for the expansion of higher education in the 1960s. It is however not necessary to have a direct relationship between funding and growth. Again using Sweden as an example, the expansion of the higher education system in the 1990s was characterised by a faster increase of the number of students than the funding (Sundqvist, 2002). However, clearly the most drastic and cost-efficient way to increase the system is to change its definition. This was done in Sweden with the 1977 reform when former non-university studies were included in higher education system. A similar process took place in Finland in the 1990s, when former upper secondary vocational training was transformed into higher education by the introduction of a new type of higher education institutions, the AMKs, and in Denmark in 2009 when the business schools were given higher education status. In Norway, the smaller regional colleges have had a stronger position than in the other studied countries and they have been part of the system since 1971.

A third driving force in the expansion of higher education is educational inflation, which positions the educational system in relation to the labour market. As higher education for different reasons becomes more widespread, and increasing proportions of the youth cohorts continue into higher education, the labour market returns to education may diminish. The inflation tendencies become more apparent in times of economic crisis, when the competition for labour increases, as in the 1990s. An effect of the inflation is that the expansion of the educational system can lead to upgraded degree requirements. When larger proportions of an age cohort reach higher education, it becomes important for professions to adapt to this and require more education for entry into the profession, further increasing the rationale for higher education studies.

These different factors are of course also interrelated. Improved conditions for an expansion have led to an increase, which in itself has triggered further growth due to sharpened competition for jobs and upgraded entry qualifications. From these general remarks on the overall expansion, we continue with discussing in more detail the expansion with regard to types of studies, types of institutions and fields of study.

6.3 Types of study

Today, all the Nordic countries have implemented the three cycle structure of the Bologna process, where the overlaying cycles require exams from the underlying cycles. For our four countries it is noteworthy that the time frame has differed. Denmark had already in 1993 introduced a 3+2+3 system and the system was thus in line with the Bologna model. For the others it ranged from the implementation in Norway in 2003, to 2007 for Sweden with Finland in 2005. Even more importantly, the Bologna system was varied in line with the existing national systems. In Norway, higher education studies had traditionally led to two types of degrees, bachelor's and master's, but these were not aligned with the time structure of the Bologna system. The bachelor's degree required 3.5 to 4 years and the master's an additional 1.5 to 2 years, adding up to 5 or 6 years of study. Finland had had both master's and bachelor's degrees up until the 1970s, when the master's degree became the only level. The bachelor's degree was however reintroduced in the beginning of the 1990s at the universities, but it has not become a sufficiently important degree in relation to the labour market, and the master's

the labour force grew from 26 to 31 per cent between 1981 and 2001 (Statistics Norway 2008). In Denmark, the same share increased from 9 per cent in 1960 to 28 per cent in 2007 (Danmarks Statistik 2008). The development in Sweden was similar, and the share in government services grew from 20 to 30 per cent between 1960 and 2000 (Edvinsson 2005).

degree functions as the main university degree. As the AMKs were established, their degrees were also defined at the bachelor's level. Sweden had probably the most complex system, with on the one hand general degrees of bachelor's (3 years), and master's (4 years), and a variety of professional degrees ranging from 2 years to 5.5 years (including in between 2.5, 3, 3.5, 4, 4.5 and 5 year degrees). The implementation of the Bologna process thus had very different preconditions within the four Nordic countries, with Denmark most aligned and Sweden furthest away.

In addition, it is important to highlight that there is a difference between on the one hand, Denmark and Finland, where higher education studies are conducted in programmes, and Sweden and Norway, where programme studies are parallel with course studies (implying that the students themselves combine courses to a degree). Norway has, however, with the Bologna implementation moved in the direction of a programme based system, while the Bologna implementation has not decreased the enrolment in courses in Sweden. What is apparent in the Swedish case is a rise in the relative importance of general programmes over professional programmes.

With more detailed examination of the development of the types of programmes in each country, the picture differs. In Sweden, it is clear that the reforms of higher education have affected the length of studies. Up until 1993, 2, 3 and 4 year programmes increased steadily, while the 1993 to 2007 period saw an increase in the 3 and 4 year programmes, which shifted focus to 3 and 5 year programmes with the Bologna-implementation in 2007. Only considering the length, there is a tendency towards a homogenisation in the Swedish case, and a slight tendency to an increasing proportion of longer programmes.

In Norway, both the bachelor's level and the master's level have increased their numbers of entrants since the mid 1970s, but proportionally the students on bachelor's level increased up until 1990; thereafter the proportion of entrants into the master's level has increased, especially after the introduction of the Bologna system in 2003. Thus, also in Norway there is an increased importance of longer programmes.

In Finland, the level of the studies is better analysed in relation to the type of institution. Up until the 1970s, bachelor's and master's developed at the same rate at the universities, whereas from the 1980s to 2005 the bachelor's programme diminished while the master's degree flourished. At the universities, after the reintroduction of bachelors in the beginning of the 1990s, they started to grow again, but only after the implementation of the Bologna process their numbers increased fast. At the AMKs bachelor's degrees have exceeded the number of university master's since the year 2000. In addition, the AMKs were granted the right to provide master's degrees in 2002, but the numbers are still marginal. The Finnish case, where type of education is related to type of institution, displays an increasingly complex structure.

Again in the Danish context, the level of studies must be understood in relation to the institutional structure, where the types of institution are even more clearly related to the types of programme than in the Finnish case. In fact, the three major types of institutions correspond to three different levels: business academies (short cycle programmes, usually 2-3 years), university colleges (medium cycle programmes, usually 3-4 years) and university institutions (long cycle programmes, consisting of a bachelor's and master's degree, usually 5 (3+2) years). These types of institution have not expanded evenly. While the business colleges have had a constant small share of entrants, the universities have expanded their share and university colleges have seen fewer entrants relative to the other higher education institutions. Since many of the university college institutions have had capacity to admit more students than have applied in the period depicted, the figures also show the relative decrease in popularity of the university college programmes, and the parallel increase in popularity of the university programmes. The Danish case stands out as having the most pronounced expansion at the most prestigious level, the longer university programmes.

6.4 Fields of study

Despite differences in the classification of fields of studies in the different national contexts, some general results are discernible. In fact, the main trends in the development in the number of students are quite similar in the four Nordic countries. Numerically there has been an increase in most fields of study, but the relative size and relative development vary between fields and subfields.

Such variations may partly be understood as reflections of changes in labour market demand, with its shift from agricultural production to industrial production and services (see section above on the overall expansion). Besides increasing the total demand for higher education, such changes will probably also affect both the supply and demand of different educational programmes. Some changes in the relative size of industries are common for the Nordic countries, whereas others are country specific. The strong demand for labour to the petroleum-related industries in Norway will probably not have any counterparts in the other Nordic countries.

Another driving force in the expansion of higher education is educational inflation, which will probably vary between educational fields, as they relate in different way to the labour market (over- versus underproduction of students in relation to available positions). A third kind of possible explanation is cultural. For example, there has been a change in the management ideals and the perception of what is a suitable education for a business executive. Formerly, a degree in graduate engineering or in law could be suitable for management positions, whereas these degrees today are increasingly losing ground to degrees in business administration (e.g. MBAs). This kind of management ideal may be viewed as part of a wider cultural trend where there is strong emphasis on competition and market mechanisms. This trend also influence the public sector in the broad trend labelled “New Public Management”. Such wide trends may affect both the demand for different educational fields among students, and for different competencies among employers.

In the chapters above, we have seen a developmental trait that the Nordic countries have in common: there has been an enormous growth in Social science, business and law, and this field is the largest in terms of student numbers at the end of the observation period (around 2010). This growth seems mainly to be driven by a rapid expansion of Business administration. This development may be understood in terms of all the three kinds of explanations sketched above. There has been an educational inflation, which has led to exceeding educational requirements for the same kind of work. Labour market positions, for which completed upper secondary education would suffice for some decades ago, may now require an MBA degree. The development may also be seen as a reflection of changes in the economy. The industry of business services, for example, has grown tremendously and its share of the total labour force in Norway doubled from 1991 to 2007. (<http://www.ssb.no/a/magasinet/analyse/tab-2008-10-13-02.html>). Similarly, the proportion of the Swedish labour force in the industrial branch including wholesale and retail trade, banking, insurance and business services grew from 14.3 per cent in 1960 to 22.5 per cent in 2000 (Edvinsson 2005).

Another big and growing field in all the Nordic countries is Health and welfare. This is the second biggest field at the end of the observation periods, in both Denmark and Norway. The chapter on Finland does not present total numbers, but presents the universities and the AMK sector separately, but health and welfare seems to be the second largest field in the two sectors combined. In Swedish higher education, the field labelled Medicine and health is amongst the second largest. This development may also be viewed as a reflection of increasing demand. The industry of Health and social services has grown tremendously and its share of the total labour force in Norway doubled from 1975 to 2007, from 9.7 to 19.2 per cent. (<http://www.ssb.no/a/magasinet/analyse/tab-2008-10-13-02.html>). This educational field consists mainly of professional education highly regulated by the health care system and the authorities. This education is regulated according to the needs of the health sector. Thus, education in Medicine, health and social services have taken on a slow and steady growth.

The field of education has increased numerically and decreased relative to other educational fields in all four Nordic countries. The development in humanities and arts has been similar to that of education in Denmark and Norway. The field of science, mathematics and computing has had an uneven development, with a substantial increase in the subfield of computing up until the burst of the dotcom bubble in the early 2000s, followed by an initial decrease and a small increase in the last couple of years. In engineering, manufacturing and construction we have seen a downward trend relative to other fields. One dimension of this development may be the abovementioned reduction of the manufacturing industries in the Nordic countries.

One can here notice a difference between fields most closely related to the private industrial sector and fields oriented towards public sectors such as health and education, where the conjunctures for the former, especially technology and science, varies more than for the latter.

The expansion of the fields of study can also be analysed from a system-oriented perspective. In the Swedish case, the reforms of 1977 and of 1993 created very different conditions for expansion. The centralised and administration driven system that was introduced in 1977 corresponded to a rather stable development of the different fields of study, whereas the introduction of a more market oriented model for allocation of funding of higher education and distribution of study places created more drastic changes and larger differences between fields.

6.5 Institutions

In the Nordic countries the institutional structures of higher education have changed considerably during the years of expansion and massification. In addition to the growth in numbers and size of institutions, the general trend has been one of overall diversification. However, until the years of the “education explosion” after the Second World War, the basic structures of the university systems were quite similar. Universities had been established in Sweden (Uppsala) and Denmark (Copenhagen) as early as the 1470s. In 1640, as Finland was under the rule of Sweden, a small university was established in Turku. Norway, being part of Denmark, got its first university at Oslo in 1813. During the late 19th century, in the wake of industrialisation and revival of commerce, several specialised institutions of engineering and business were established. Similarly, institutions of fine and industrial arts have their history in the latter part of the 19th century – or even earlier.

During the post-war expansion new universities and university colleges were established. They usually had a strong regional mission and character. Some of these types of institution have later expanded and gained university status. If we look at the institutional typologies developed in the country chapters, illustrating the “national understanding” of our own systems, several common features emerge, but there are also differences – especially regarding the heterogeneous group of university colleges. A common classification could include three types: universities, university colleges, and specialised institutions. Some specialised institutions have had university status in the national system from early on, and they could be also called mono-faculty universities, as in the Danish case. The specialised institutions include three main types: technical institutions, business schools and art academies. In some countries the fields like sports, veterinary medicine or agriculture exist as specialised institutions (e.g. Norway) or as faculties in universities (e.g. Finland).

The university colleges are regional institutions which mainly function in the health and welfare related fields including teacher training. In the Finnish case this sector (the AMKs) is separate from the universities, and it includes, for instance, studies in business, engineering, and culture. A typical feature of university colleges is that they are professionally oriented, teaching centred, and lack a research function, or have substantially lesser research funding as compared with the universities. In the Swedish case, for instance, some of these institutions have received university status, and are called new universities in the presented typology.

Regarding system expansion, relatively similar overall trends emerge. After the long years of growth in the number and size of higher education institutions, expansion has slowed down or even levelled, and there has been a move towards structural rationalisation and mergers. Examples of relatively aggressive merger policies can be found, for instance, in Denmark and Finland. On the other hand, expansion has been maintained by upgrading new sectors, formerly not part of higher education, to the higher education system. The founding of the AMKs in Finland serves as an example of a reform which more than doubled the number of higher education institutions overnight. If we look at the expansion in relative terms, it is evident that growth has been directed especially to the specialised institutions and the university colleges. This is very clear in the case of Finland, where the new type of institutions, the AMKs, introduced in the 1990s saw their number of students increase steeply at the same time as the enrolment to the universities was staggering. In Sweden, the university colleges tripled their numbers while the universities did not increase by any more than 50 per cent. For the latter half of the 1990s, when there is relevant data in Norway, the university colleges grew continuously, while the universities had stable numbers. The exception here is Denmark, where the university sector has had the most prolific development and a steady increase in absolute and relative numbers.

However, looking at the developments more closely at the level of individual institutions, more complex patterns emerge. Expansion at the institutional level is not always continuous. Some institutions exhibit quite constant development while others show fluctuations and even stagnation. The situation of the Norwegian private colleges, which are also in other respects a deviation from the Nordic institutional model, serves as one example.

One conclusion from the institutional development is that much evidence suggests that the university sector has become much more exclusive in relative terms over time. While, on the one hand, the whole system of higher education has expanded rapidly in our four countries, and increasing shares of an age cohort have entered higher education, studies at universities and specialised institutions, have on the other hand become more exclusive among higher education students. Whether this also translates into a more socially and meritocratic exclusive recruitment to these institutions will be a central question in future publications from the project.

6.6 References

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Appendix

Data and definitions

Denmark

The chapter on Denmark is based on administrative population register data from Statistics Denmark, Denmark's official register authority. Three main sources have been used: a) yearbooks from Statistics Denmark, b) StatBank Denmark, Statistics Denmark's online registers, and c) individual level register data deriving Statistics Denmark and compiled by Jens Peter Thomsen in his postdoctoral project "Access to higher education in Denmark 1980-2010" funded by the Social Science Research Council. Under each graph, the source of the data is stipulated.

"Enrolled students" are defined as students that are registered on a given higher education programme as per January 1st each year. There will only be one registration each year for each student, meaning that the number of enrolled students equals the actual number of students enrolled in higher education programmes.

"Entrants" are defined as the number of students who have been admitted to a higher education programme each year. It is possible to be admitted to two different programmes in the spring and fall semester, meaning that persons can count more than one time each year (although this is likely to be very few).

"Degrees awarded" means completion of a programme or a degree. One person could be counted several times, each time a programme or degree is completed.

Finland

The chapter on Finland utilises different kinds of data and statistics resources made available or provided by Statistics Finland. Various time series on numbers of registered, entered and graduated university students by fields of study and gender from 1950 to 2010 are compiled from relevant tables of relevant volumes of Statistical yearbook of Finland (specific tables and volumes are identified under the figures). Data on number of 20-year olds and on number of university degree holders by years of birth are drawn from StatFin open-access data-base. Matriculation rates (MR) and participation rates (PR) are based on longitudinal census data. In figure 3.6, in order to avoid double counting the number of enrolling students is obtained by cropping out graduating and entering student from total number of registered students. Otherwise, if not mentioned, the data comes from the national databases KOTA (kotaplus.csc.fi) covering the years 1981-2009, and VIPUNEN (vipunen.csc.fi) covering data from 2010 onwards.

Number of registered students entails all students registered in a university for full or half semester regardless of level or field of study. Entrants refer to all new present and absent students who have registered regardless of level of study. Graduates refer to all students who have been awarded a degree regardless of level of study. In figures specifying numbers of registered, entered and graduated students by fields of study the Finnish classifications of fields of education ("koulutusala") are used as concerns universities and Finnish classifications of fields of study ("opintoala") are used as concerns UASs. More detailed breakdowns by 2-digit ISCED levels for all Nordic countries covering the period 1998-2012 are available at iLibrary open-access data-base of the OECD. However, here we have confined ourselves with Finnish data sources only and hence the breakdown by fields reflects the most detailed level available from those sources.

Norway

The chapter on Norway is based on different kinds of data from Statistics Norway. The historical data graphs (before 1975 and so far back as 1813 for some of the figures) are based on aggregated data, and the tables are found on Statistics Norway's web site. Where this kind of data is used, a direct link to the table on the Statistics Norway website is added under the figure. The definitions vary, but this is

noted under the figure and complete information can be found by following the link. The figure presenting the number of 20 year olds in the years 1846-2009, is also made from data found on Statistics Norway's website.

The figures depicting the development between 1975 and 2009 (2010 for Share of cohort for 22 year olds, 24 year olds, and 30 year olds having attended higher education, 1977–2010) and of the 1955-1987 birth cohorts are based on individual level register data from Statistics Norway. These data are made available by Statistics Norway through the project 'Professional students and professional practitioners. Studies of recruitment, study achievement and labour market careers.'

(*Profesjonsstudenter og profesjonsutøvere. Studier av rekruttering, studiegjennomføring og yrkeskarriere*) at the Center for the Study of Professions at Oslo and Akershus University College for the Applied Sciences. The data have some limitations regarding the birth cohorts. The units in our individual level data are everyone in Norway born between 1955 and 1990, and people born before 1955 who have completed any tertiary education. There are no data on people born after 1990, and, if the students have not graduated (completed their education), we only have data on the ones born between 1955 and 1990. Our numbers on awarded degrees is as a result more complete than the numbers on entrants and registered students, especially at the beginning of the period.

"Registered students" are defined as students that are registered on a study programme October 1 each year. There can be only one registration each year for each student. If the students have more than one registration per year, we have, firstly, chosen fulltime studies over part time, secondly, we have chosen courses the student graduates in over courses in which the student have failed, and last, we have chosen the first registration in the year.

"Entrants" are defined as students who enter their first study (except the preparatory courses 'Examen Philosophicum' and 'Examen Facultatum') and is measured October 1. In all the figures but the ones regarding level of studies (figure 11 and 12), this registration is one time for each student. In figure 11 and 12, there is one registration for each entry on a new level (maximum three registrations for each student).

"Degrees awarded" are defined as completion of a programme or a degree. One person may be counted several times, each time a programme or degree is completed.

For the years after 2009, numbers on aggregate level from Statistic Norway is used. This information is provided by Torill Vangen in Statistics Norway, 14.11.2013. Registered students is also here counted one time each year by October 1, and if a student has several registrations, the first filter is fulltime studies, but as the second criterion, Statistics Norway use educational duration (klassetrinn) and thirdly the educational level (utdanningsnivå) (Vangen, 2007: 13). This means that while our definition will reflect if it is a graduation course and how long the student have been registered on the study programme, Statistic Norway's definition will reflect the level of the education. Most students however are registered on only one fulltime study programme, so the differences between the two definitions only apply to a small subsample each year. Entrants is measured one time for each student October 1. We have not used any additional information on awarded degrees.

Sweden

All analyses are based on different kinds of data from Statistics Sweden. Section "5.3 Expansion of the system" is mainly based on aggregated data from tables in *Statistical Yearbook of Sweden*, the 1959–1979 editions, covering the academic years 1950–1976. From the academic year 1977 onwards, information on student and entrant numbers as well as number of 20 year olds for the period 1950–2011 can be accessed through the website of Statistics Sweden. The share of cohorts with 14 years or more of education and cohorts in higher education at given moments are calculated on Total Population Registers and Higher Education Register retrieved from Statistics Sweden, and also comparing with aggregated data from *Utbildningsstatistisk årsbok* (2012).

Section 5.4 “Type and level of studies” through 5.6 “Institutional landscape” uses micro data from the Higher Education Register, which covers the years 1977–2009.

“Registered students” are defined as the gross number of students that are registered on a study programme (or course) on October 15. This means that one single student may be counted several times if registered on different study programmes.

“Entrants” are defined as students registered for the first time in higher education.

“Degrees awarded” are defined as completion of a programme or a degree. One person could be counted several times, each time a programme or degree is completed.

Tables for chapter 4 Norway

Table A4.1: List of higher education institutions, grouped.

State colleges & new universities	Private colleges
Samisk høgskole	Baptistenes teologiske seminar
Høgskolen i Finnmark	Diakonhjemmets høgskolesenter
Høgskolen i Tromsø	Den Polytekniske Høgskolen
Høgskolen i Harstad	Norsk Lærerakademi
Høgskolen i Narvik	Stiftelsen Varhandelens Høgskole
Høgskolen i Bodø (nå universitet)	Encefalon A/S
Høgskolen i Nesna	Frikirkens Teologiske Høgskole
Høgskolen i Nord-Trøndelag	Høgskolen for Diakoni og Sykepleie
Høgskolen i Sør-Trøndelag	Menighetssøsterhjemmets høgskole
Høgskolen i Molde	Den Norske Eurytmihøgskolen
Høgskolen i Ålesund	Rudolf Steinerhøgskolen
Høgskolen i Volda	Oslo Merkantile Høgskole (OMH)
Høgskolen i Sogn og Fjordane	Atlantis Medisinske Høgskole
Høgskolen i Bergen	Norsk Reiselivshøgskole A/S
Høgskolen i Stord/Haugesund	Ansgar Bibelskole
Høgskolen i Stavanger (nå universitet)	Mediehøgskolen, Gimlekollen mediesenter
Høgskolen i Agder (nå universitet)	Misjonshøgskolen
Høgskolen i Telemark	Rogaland Høgskole (tidl.vernepleierhøgs
Høgskolen i Vestfold	Rogaland Markedshøgskole
Høgskolen i Buskerud	Betanien Sykepleierhøgskole
Høgskolen i Gjøvik	Diakonissehjemmets Sykepleierhøgskole
Høgskolen i Lillehammer	Metodistkirkens Studiesenter
Høgskolen i Hedmark	Dronning Mauds Minne
Høgskolen i Østfold	Nordk Høgskole for Helhetsterapi
Høgskolen i Akershus	NKS Høgskolen. Tidligere OMH og Norsk Re
Høgskolen i Oslo	Meyer Robert Kunsthøgskole
Aesthetic colleges	Fjellhaug Skole
Bergen Academy of Art and Design	Norsk gestaltinstitutt A_S
Oslo National Academy of the Arts	Høgskulen på Jæren
Den Norske Balletthøgskole	Norsk lærerakademi lærerhøgskolen
Barratt Due Institute of Music	Bjørknes høyskole A_S
Bergen School of Architecture	NKI fjernundervisning A_S
Skrivekunstakademiet i Hordaland	Akupunkturhøgskolen
The Oslo School of Architecture and Design	Scientific colleges
Norwegian Academy of Music	BI Norwegian Business School
Other	Norwegian School of Economics and Business Administration (Oslo)
The Norwegian Police University College	Norwegian School of Economics and Business Administration (Bergen)
Høgskolestiftelsen på Kjeller	Insurance Academy (part of BI since 2002)
Statens Lærerkurs	Norwegian School of Sport Sciences
Ministry of Foreign Affairs Aspirant Course	Norwegian School of Veterinary Science
Militære høyskoler	MF Norwegian School of Theology
Skatteetatsskolen i Oslo	Norwegian University of Life Sciences (previously Agricultural University of Norway)
Luftfartsverket/Avinor A/S	Norwegian School of Economics(NHH)
Skatteetatsskolen i Bergen	
NRK Personalopplæring	
Higher education Abroad (fra Lånekassen)	Universities
Higher Education, unknown institution	Norwegian University of Science and Technology (NTNU)
	Universitetet i Tromsø
	Universitetet i Oslo
	Universitetet i Bergen

Some of the institutions have changed category during the period.

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